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**Yoshizuka et al.**

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[45] **Date of Patent:** Nov. 13, 1990

[54] **DISPLAY DEVICE IN IMAGE FORMING APPARATUS**

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[52] **U.S. Cl.:** ..... 355/209; 355/313

[58] **Field of Search** ..... 355/209, 218, 244, 313,  
355/314

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**Primary Examiner**—R. L. Moses

**Attorney, Agent, or Firm**—Antonelli, Terry, Stout & Kraus

[57] **ABSTRACT**

A display device in an image forming apparatus includes a liquid crystal display panel. The display panel selectively displays two types of modes, that is, a normal mode and a special mode. In the normal mode, a copy volume, a copying magnification, a copy density and the like are displayed. In the special mode, the contents for setting edit copies, the contents for setting composite copies and the like are displayed. According to the present invention, the special mode is displayed during only a constant time period in a case where each of special mode setting keys is operated. In the other cases, the display mode is automatically switched to the normal mode. More specifically, the normal mode which a user desires to know is usually displayed on the display panel. Only when the user sets the special mode, the special mode is displayed in response to an operation of each of the special mode setting keys. Accordingly, the display device has good operability.

**4 Claims, 4 Drawing Sheets**

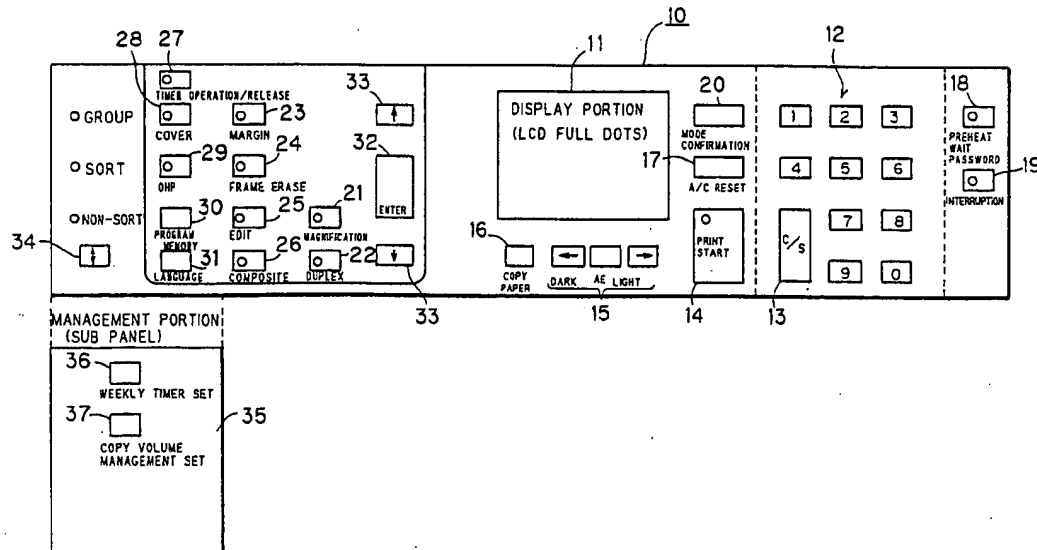


FIG. 1

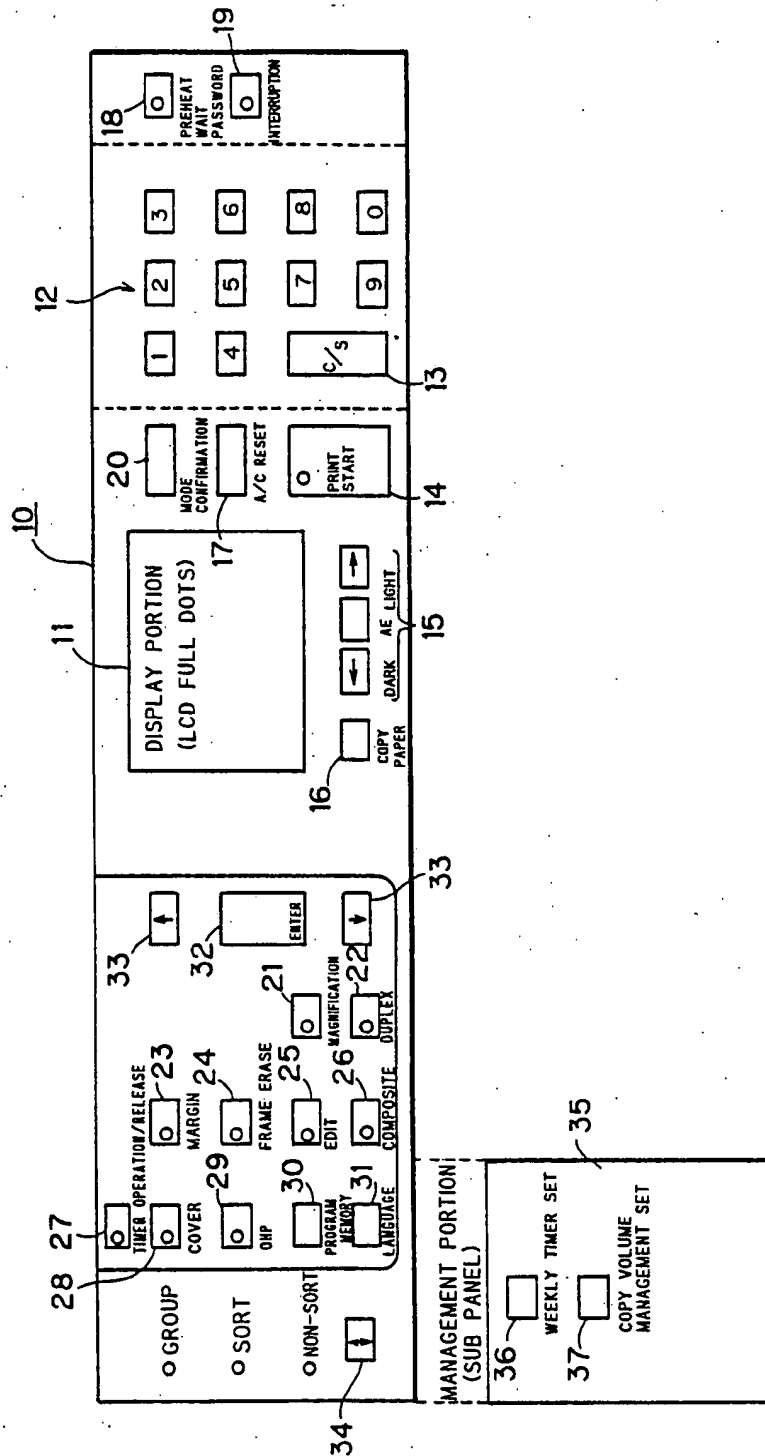


FIG. 2A

## DISPLAY OF NORMAL MODE

B		B	5	COPYING IS READY  <div style="display: flex; justify-content: space-between;"> <div>           0000 0000            1 3 5 7 9         </div> <div>100%</div> <div>           12 100         </div> </div>
3		A	3	
2		B	4	
1		A	3	

FIG. 2B

## DISPLAY OF SPECIAL MODE

ODD SIMPLEX → DUPLEX	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; width: 40px; height: 40px; margin-right: 10px;"></div> <div style="font-size: 2em;">→</div> <div style="border: 1px solid black; width: 40px; height: 40px; margin-left: 10px;"></div> </div>
EVEN SIMPLEX → DUPLEX	
DUPLEX → SIMPLEX	
DUPLEX → DUPLEX	

SELECT BY  $\Delta$   $\nabla$  AND DEPRESS ENTER KEY (SETTING END KEY)

FIG. 2C

## DISPLAY OF SETTING OF SPECIAL MODE

ODD SIMPLEX → DUPLEX	DUPLEX → DUPLEX IS SET
EVEN SIMPLEX → DUPLEX	
DUPLEX → SIMPLEX	
DUPLEX → DUPLEX	

FIG. 3

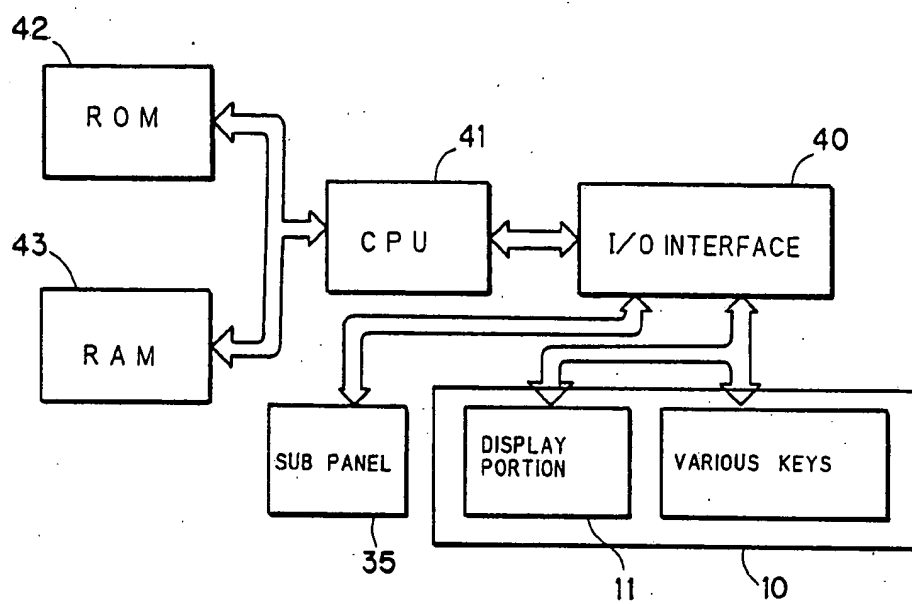
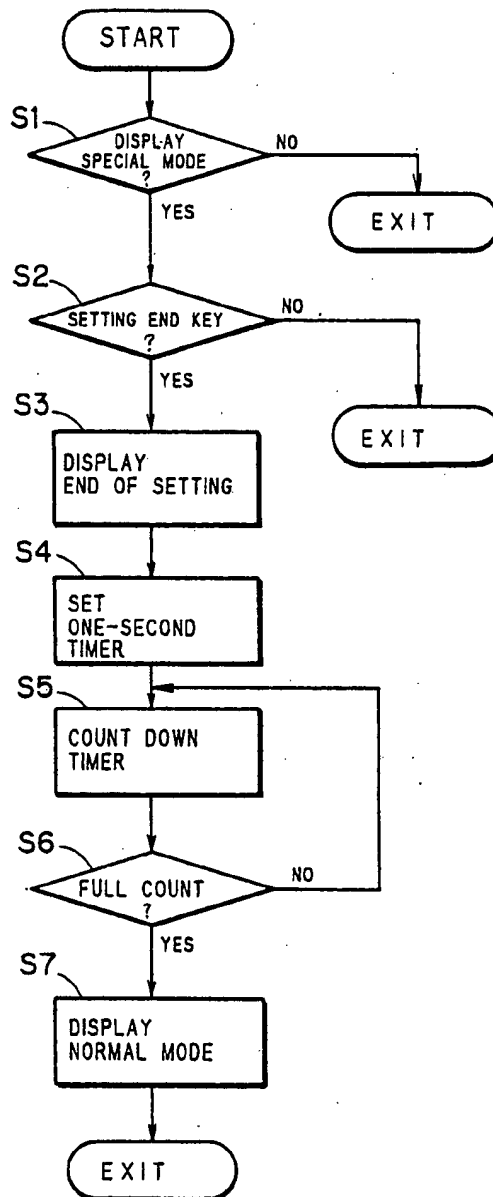


FIG. 4



## DISPLAY DEVICE IN IMAGE FORMING APPARATUS

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention relates to display devices in image forming apparatus such as electrophotographic copying apparatus and facsimiles machines.

#### 2. Description of the Prior Art

In recent years, electrophotographic copying apparatus have been adapted to perform multiple functions, that is, to be able to make not only normal copies but also various copies such as enlarged copies and reduced copies, to edit copies such as by partial erasing and partial extraction, and to make composite copies and duplex copies.

Therefore, the conventional electrophotographic copying apparatuses performing multiple functions include, in many cases, those adapted such that there are provided, as display devices, a normal mode display device for displaying the contents necessarily required for a copying operation such as a copy volume and a copy density and a special mode display device for displaying the contents for setting the edit copies, the contents for setting the composite copies, and the like.

Furthermore, as another example the conventional electrophotographic copying apparatus include those adapted such that a single display device is used both as a normal mode display device and a special mode display device to display a necessary display mode using a display switching button.

The former electrophotographic copying apparatus in which two display devices are provided for respectively displaying the normal mode and the special mode have the disadvantages of taking much space and of being high in cost.

On the other hand, the latter electrophotographic copying apparatus in which a single display device can display both the normal mode and the special mode by switching do not have the above described disadvantages but have the disadvantage of inferior operability.

Not only the electrophotographic copying apparatus but also facsimile machines adapted to perform multiple functions have the above described disadvantages.

### SUMMARY OF THE INVENTION

Therefore, a primary object of the present invention is to eliminate the above described disadvantages and to provide a display device in an image forming apparatus capable of displaying a plurality of modes by a single display device and having good operability.

Briefly stated, the present invention is directed to a display device provided in an image forming apparatus for displaying predetermined data, which comprises display means capable of selectively displaying a first mode or a second mode and usually displaying the first mode, second mode setting means for setting the second mode, operation mode setting means for setting, then the display means displays the second mode, an operation mode of the image forming apparatus based on the contents of the second mode, and automatic display switching means responsive to an output of the operation mode setting means for automatically switching the display mode of the display means from the second mode to the first mode.

Thus, according to the present invention, in a case where the display means displays the second mode, if

the operation mode of the image forming apparatus is set based on the contents of the second mode, the display mode is then automatically switched to the first mode. More specifically, according to the present invention, the contents displayed in the display device can be automatically switched to the contents which a user desires to know. In particular, a particular mode is set and displayed and, then, the display mode is automatically switched to a general mode indicative of an operating state of the device. Accordingly, there can be provided a display device convenient for a user.

The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention then taken in conjunction with the accompanying drawings.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a plan view illustrating an operation panel of an electrophotographic copying apparatus according to an embodiment of the present invention;

FIGS. 2A, 2B and 2C are diagrams showing examples of the contents displayed in a display portion;

FIG. 3 is a block diagram showing the construction of a control circuit of the display portion; and

FIG. 4 is a flow chart showing a display control operation of the display portion of the electrophotographic copying apparatus according to an embodiment of the present invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 is a plan view illustrating an operation panel 10 of an electrophotographic copying apparatus according to an embodiment of the present invention. The operation panel 10 is provided with a display portion 11. A liquid crystal display panel having a plurality of dots arranged in a longitudinal and lateral matrix is employed as this display portion 11. Arbitrary dots enter the displayed state in response to an applied signal, so that data is displayed in the liquid crystal display panel. A portion where data is displayed in the operation panel 10 is only this display portion 11.

On the operation panel 10, there are further arranged a ten-key 12 for entering numeric data such as a copy volume, a clear/stop key 13 operated when the numeric data erroneously entered by the ten-key 12 is cleared and when it is desired to stop a copying operation in the course thereof, a print start key 14 for indicating the start of the copying operation, a copy density setting key 15 for setting a copy density, a copy paper selection key 16 for selecting the size of the copy paper, an all clear key 17 for clearing all data set in the electrophotographic copying apparatus, a preheat key 18 for switching the electrophotographic copying apparatus between the preheat state and the standby state, and an interruption key 19 used in interruption copy. In addition, a mode confirmation key 20 for switching the contents displayed in the display portion 11 to confirm a set mode is provided on the operation panel 10. The mode confirmation key 20 is used for switching the contents displayed in the display portion 11 to the special mode in only a time period during which it is depressed.

Various keys for setting the special mode are arranged on the operation panel 10. More specifically, there are arranged a magnification setting key 21, a duplex copy setting key 22, a margin setting key 23, a

frame erase instruction key 24, an edit key 25 for setting edit copies, a composite copy setting key 26, a timer operation/release key 27, a cover copy setting key 28 operated when it is desired to change the color of only the first copy sheet in making a plurality of copies, an OHP copy setting key 29 operated when copies are made on a film for an overhead projector, a program memory key 30, a language switching key 31 for switching a display language in the display portion 11, a setting end key 32, and an indication key 33. A special copy mode can be set by the various special mode setting keys. The contents of the special mode set are displayed in the display portion 11 when each of the special mode setting keys is operated.

The special mode setting keys may be always exposed on the operation panel 10. Alternatively, the special mode setting keys may be usually covered with, for example, a transparent cover and the cover may be opened in using the special mode setting keys in consideration of the low frequency of use.

Additionally, a sorter switching key 34 for controlling a sorter portion connected to the electrophotographic copying apparatus is provided on the operation panel 10.

The electrophotographic copying apparatus further comprises a sub panel 35 in addition to the operation panel 10. This sub panel 35 is provided in a place which a user does not usually touch, for example, inside of a front door of the electrophotographic copying apparatus. Accordingly, unless the front door is opened, the sub panel 35 can not be operated. A weekly timer set key 36 and a copy volume management set key 37 are provided on the sub panel 36. The weekly timer set key 36 is used for setting times when the power supply of the electrophotographic copying apparatus is turned on and off over one week. For example, from Monday to Friday, the power supply of the electrophotographic copying apparatus is turned on at eight in the morning while being turned off at five in the evening. The copy volume management set key 37 is used for setting or confirming the situation where a copy volume is managed for each department when a plurality of departments use the electrophotographic copying apparatus. When the keys 36 and 37 are operated, the contents set by the key operations are also displayed in the display portion 11.

FIG. 2 is a diagram showing a specific example of the contents displayed in the display portion 11. FIG. 2A shows an example of the display of the normal mode. The contents displayed include the display "Copying is ready.", the display of the number of copies "12", the display of a magnification "100%" indicating that an equal size magnification is selected, the display of the copy density and the display of the kind of the selected copy paper, and the like.

FIG. 2B shows a specific example of the display of the special mode. This display is an example of the display in a case where the duplex copy setting key 22 out of the special mode setting keys is operated. At the time of this display, desired contents are selected from the contents displayed in the left column by the indication key 33, and the setting end key 32 is depressed. Then, the display in the display portion 11 is changed to the display shown in FIG. 2C. FIG. 2C shows the display indicating that the selected contents, that is, "a duplex to duplex copy mode" is set as an operation mode.

FIG. 3 is a block diagram showing an example of the construction of a control circuit of the operation panel 10. A display portion 11 and various keys provided on the operation panel 10 are connected to a CPU (central processing unit) 41 through an I/O interface 40. In addition a sub panel 35 is also connected to the CPU 41 through the I/O interface 40. The CPU 41 is connected to a ROM (read only memory) 42 storing operation programs of the CPU 41 and a RAM (random access memory) 43 to and from which data can be written at the time of arithmetic processing and the written data can be read out as required.

Meanwhile, the CPU 41 may only control the operation panel 10 and the sub panel 35 in the electrophotographic copying apparatus. Alternatively, the CPU 41 may simultaneously control other mechanisms of the electrophotographic copying apparatus. In the present embodiment, the latter is employed.

FIG. 4 is a flow chart for explaining an operation of the control circuit shown in FIG. 3.

Referring now to FIGS. 1 to 4, description is made of a display control operation of the display portion 11 according to the present embodiment.

The display control operation of the display portion 11 can be carried out by, for example, interruption processing for each constant cycle while the other mechanisms of the electrophotographic copying apparatus are controlled. When the control is started, the CPU 41 determines whether the display mode of the display portion 11 is the normal mode as shown in FIG. 2A or the special mode as shown in FIG. 2B (step S1). If the special mode is displayed, the CPU 41 determines whether or not an input signal is applied from the setting end key 32 out of the special mode setting keys (step S2).

If the input signal is applied from the setting end key 32, the CPU 41 displays the end of setting of the special mode shown in FIG. 2C (step S3), and sets a one-second timer by a soft timer using the RAM 43 (step S4). The set time of this soft timer may be time having a suitable length other than one second. The CPU 41 counts down the soft timer (step S5). In response to the full count of the timer (step S6), the CPU 41 switches the display mode of the display portion 11 to the normal mode as shown in FIG. 2A (step S7).

The display portion 11 is controlled in the above described manner. Accordingly, after the special mode is set, the special mode is automatically switched to the normal mode after a lapse of a constant time period, for example, one second. Consequently the contents of the special mode set are displayed at the time of setting the special mode and then, the operating state of the electrophotographic copying apparatus which a user usually desires to confirm is displayed in the normal mode.

Although in the above described embodiment, description was made of a case in which the display mode of the display portion 11 is switched between the normal mode and the special mode by taking the electrophotographic copying apparatus as an example, the display mode is not limited to the normal mode and the special mode. For example, the display mode may be the other modes.

Furthermore, the present invention is applicable to a facsimile other than the electrophotographic copying apparatus.

Although the present invention has been described and illustrated in detail, it is clearly understood that the same is by way of illustration and example only and is

not to be taken by way of limitation, the spirit and scope of the present invention being limited only by the terms of the appended claims.

**WHAT IS CLAIMED IS:**

1. A display device provided in an image forming apparatus for displaying predetermined data, comprising:

display means capable of selectively displaying a first mode or a second mode and usually displaying the first mode,

second mode setting means for setting the second mode,

operation mode setting means for setting, when said display means displays the second mode, an operation mode of the image forming apparatus based on the contents of the second mode, and

automatic display switching means responsive to an output of said operation mode setting means for automatically switching the display mode of said display means from the second mode to the first mode.

2. The display device according to claim 1, wherein the contents of said first mode displayed comprise the contents required for an image forming operation such as the size of an original, the size of the copy paper used for forming an image, the number of copy sheets used for forming the image, and the density of the image to be formed, and

the contents of said second mode displayed comprise the special contents such as the contents for forming an edit image such as masking and trimming and the contents for forming a composite image.

3. The display device according to claim 1, wherein said automatic display switching means switches the display mode after a lapse of a predetermined time period since the output of said operation mode setting means was detected.

4. The display device according to claim 2, wherein said automatic display switching means switches the display mode after a lapse of a predetermined time period since the output of said operation mode setting means was detected.

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**United States Patent** [19]  
**Sato**[11] **Patent Number:** **5,881,336**  
[45] **Date of Patent:** **\*Mar. 9, 1999**[54] **IMAGE PRODUCING APPARATUS**[75] **Inventor:** **Mitsuo Sato, Shibata, Japan**[73] **Assignee:** **Tohoku Ricoh Co., Ltd., Miyagi, Japan**[ \* ] **Notice:** This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).4,453,821 6/1984 Smith ..... 399/81  
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5-68667 9/1993 Japan .[21] **Appl. No.:** **713,203**[22] **Filed:** **Sep. 12, 1996**[30] **Foreign Application Priority Data**Oct. 16, 1995 [JP] Japan ..... 7-266650  
Jul. 9, 1996 [JP] Japan ..... 8-179540[51] **Int. Cl.<sup>6</sup>** ..... **G03G 21/02**[52] **U.S. Cl.** ..... **399/79; 399/85**[58] **Field of Search** ..... **399/79, 81, 82,**  
**399/83, 403, 85**[56] **References Cited****U.S. PATENT DOCUMENTS**

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*Primary Examiner*—Robert Beatty*Attorney, Agent, or Firm*—Oblon, Spivak, McClelland,  
Maier & Neustadt, P.C.[57] **ABSTRACT**

An image producing apparatus including a control panel. When a school mode is selected, numeric or alphanumeric keys are pressed on a keypad so as to select one or a plurality of classes or grades. Numerical data concerning the number of students per class and grade are extracted, and are registered as the number of prints to be produced and sorted.

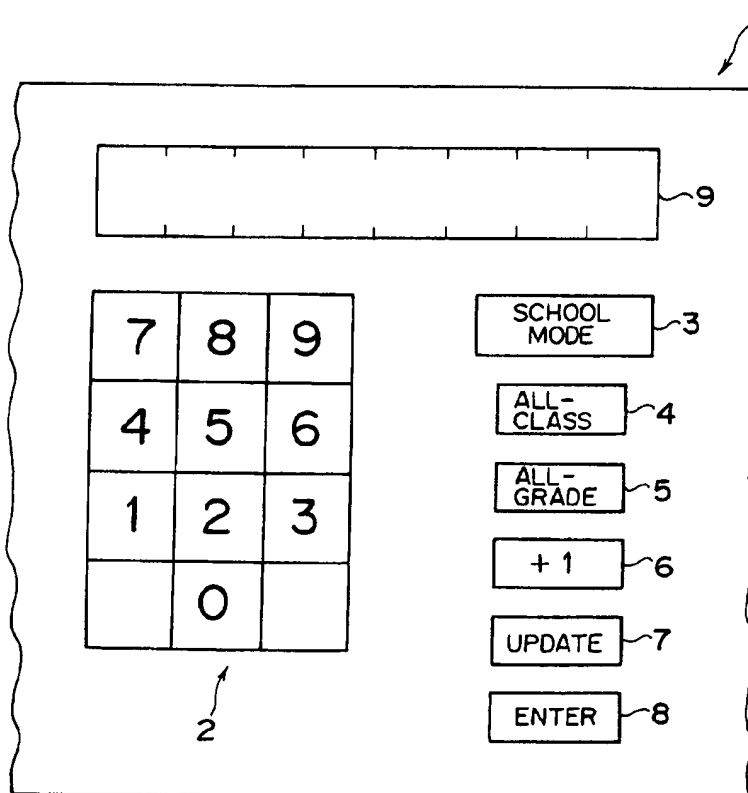
**13 Claims, 8 Drawing Sheets**

FIG. 1

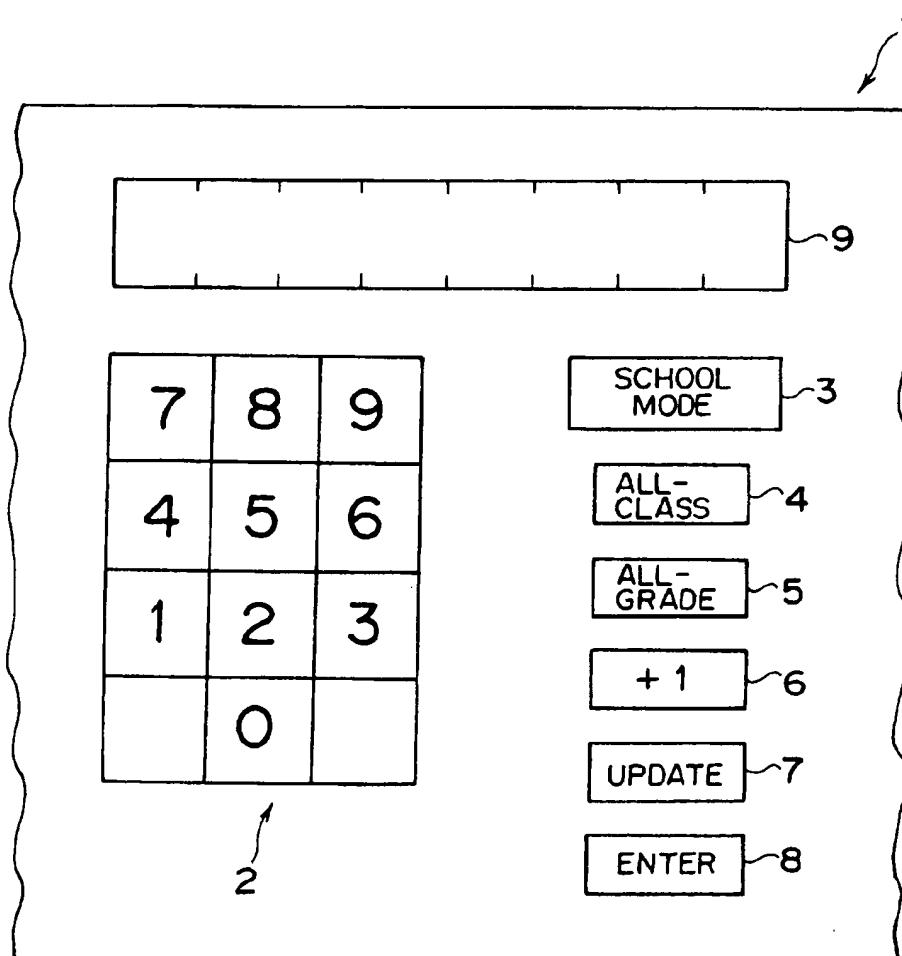


FIG. 2

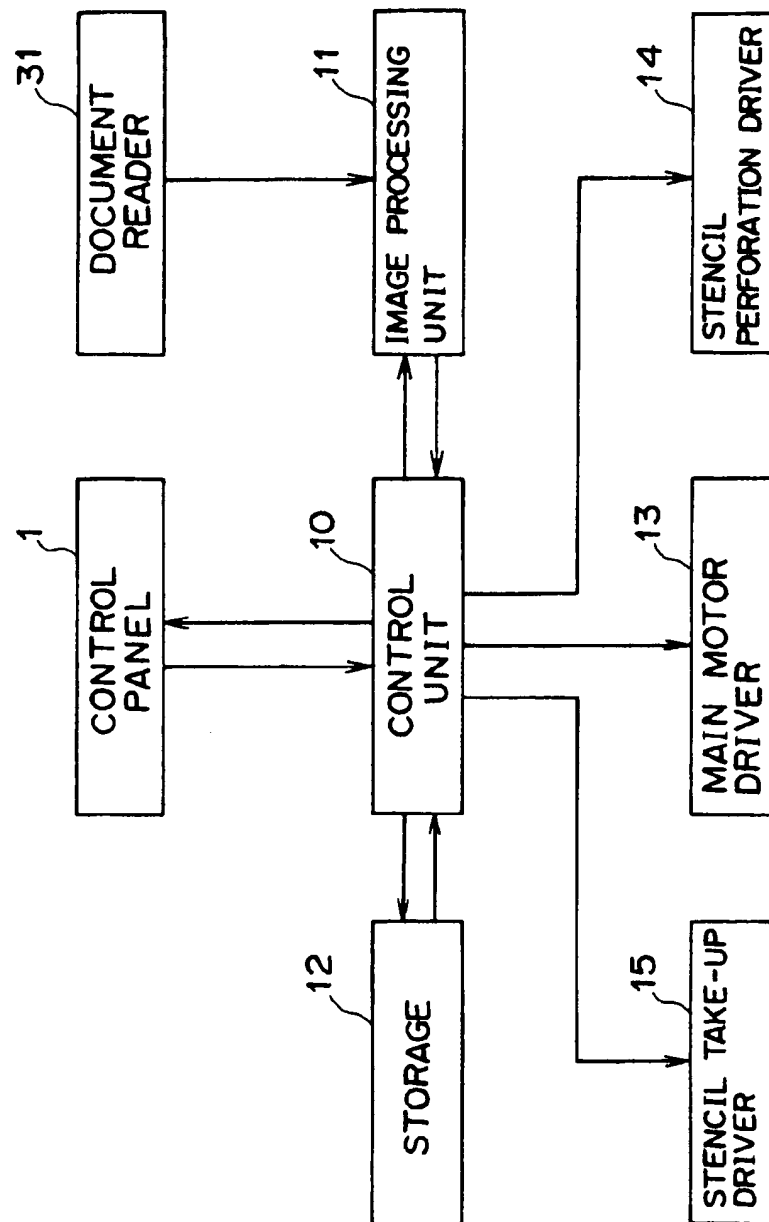


FIG. 3

	CLASS 1	CLASS 2	CLASS 3	CLASS 4	SUB-TOTAL
GRADE 1	3 0	2 8	3 2	3 1	1 2 1
GRADE 2	3 4	3 3	3 2	3 0	1 2 9
GRADE 3	2 8	2 9	3 0	3 2	1 1 9
				GRAND TOTAL	3 6 9

FIG. 4

	—					3	0
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FIG. 5

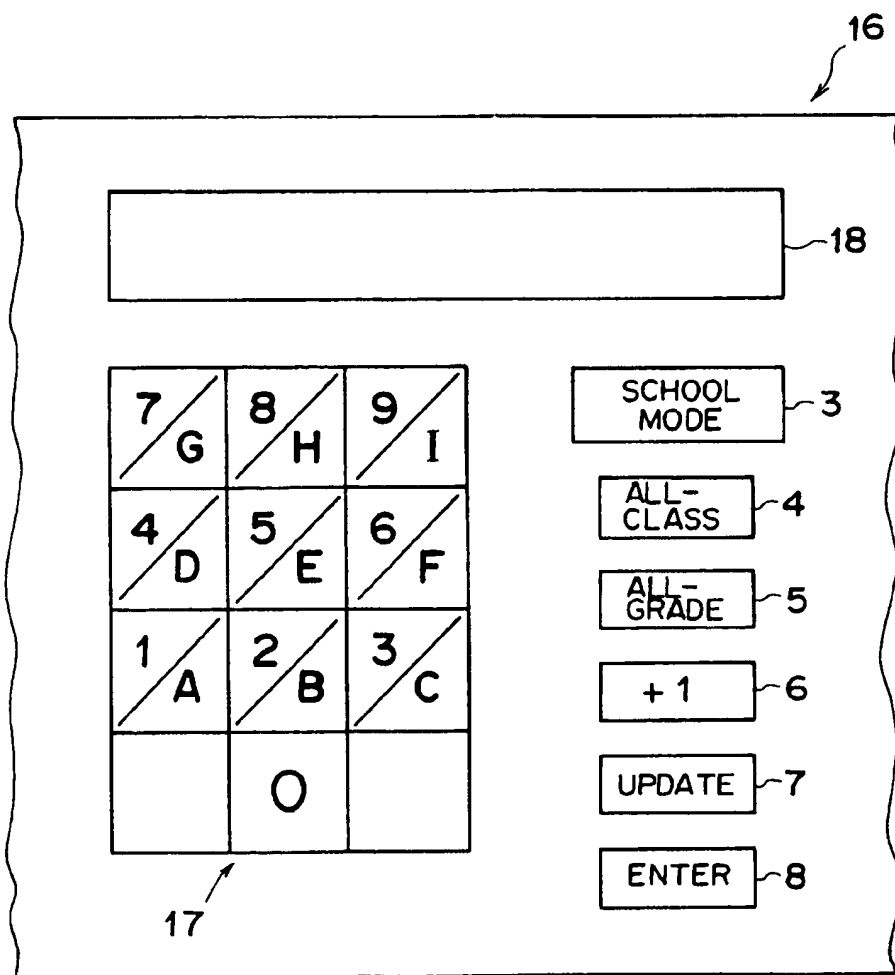


FIG. 6

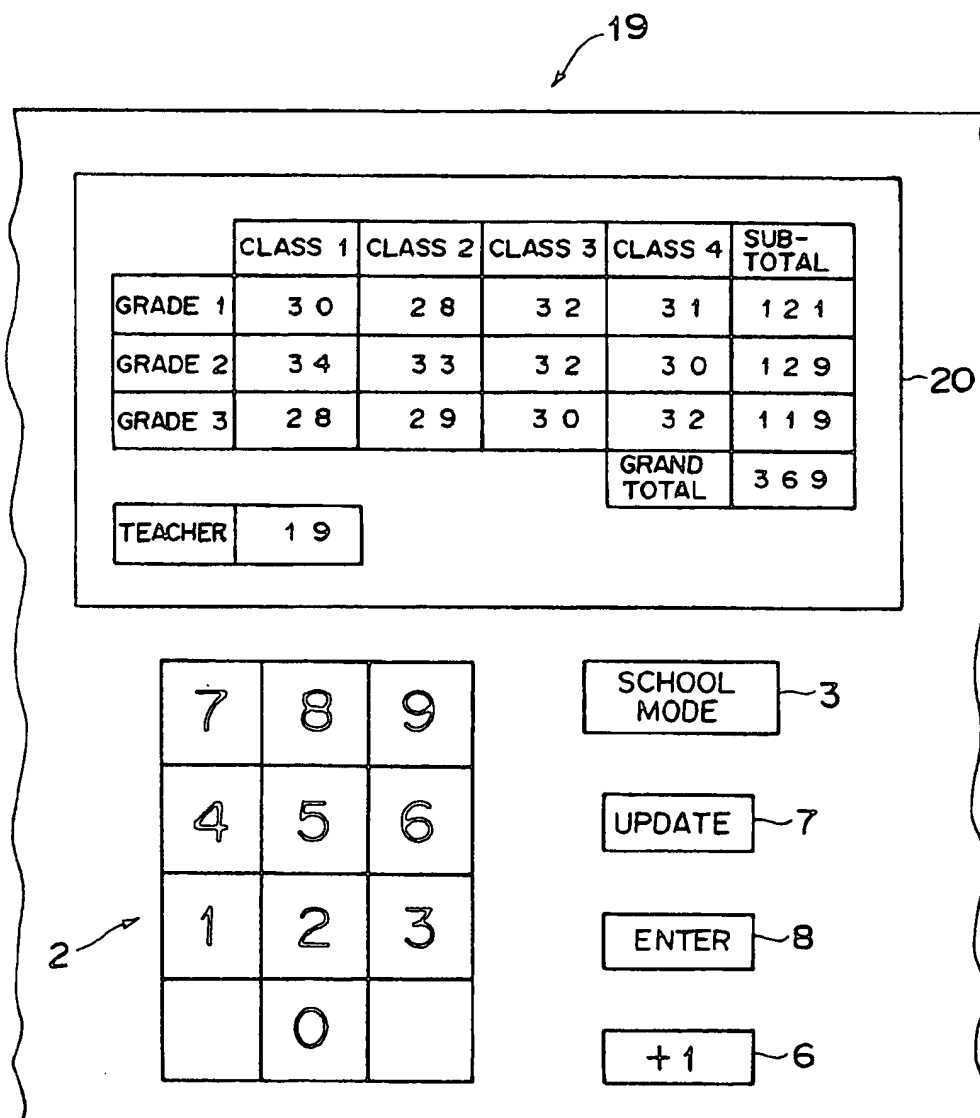




FIG. 8

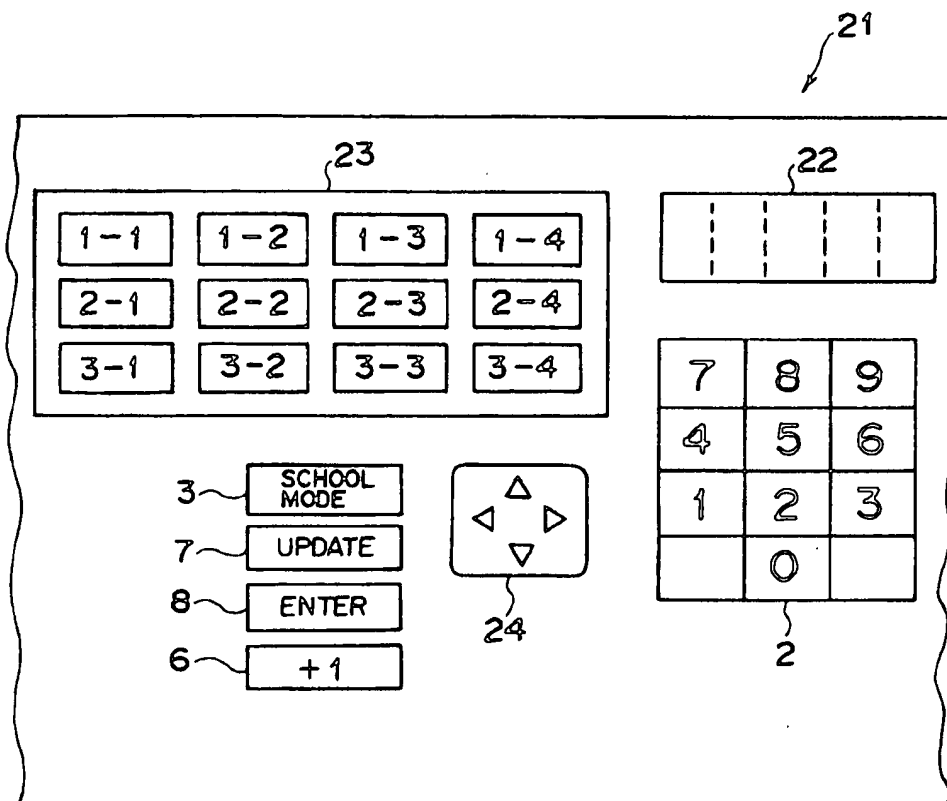


FIG. 9

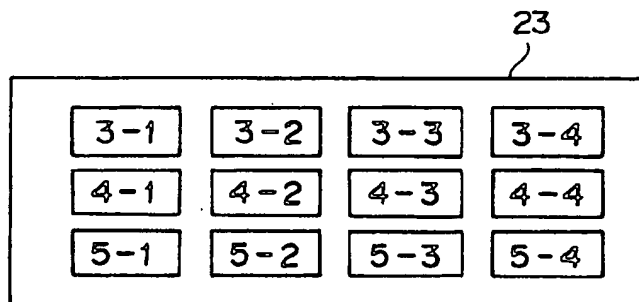
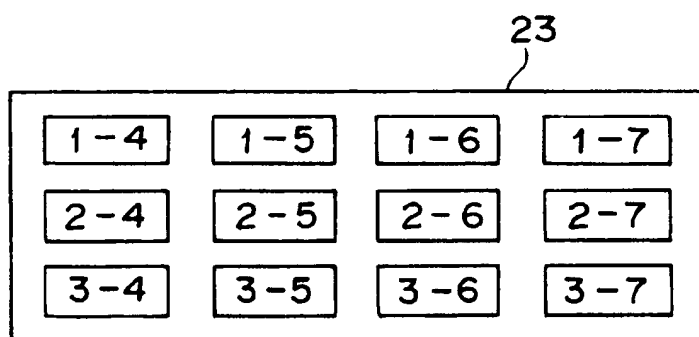




FIG. 10



## IMAGE PRODUCING APPARATUS

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

This invention relates to an image producing apparatus such as a printing machine, a copying machine and a printer, and, more particularly, to control functions for such an image producing apparatus.

#### 2. Description of the Prior Art

Recently, more image producing apparatuses have been installed in educational institutions as well as in business firms. Some schools have operators dedicated to operating such image producing apparatuses. However, most copying or printing jobs are carried out by teachers.

A variety of documents are copied or printed in the school. For instance, contents of copied or printed papers may be different in each class (class newspapers), may be different in grades (e.g., examination papers), or may be the same throughout the school (e.g., PTA newspaper).

In order to copy or print the foregoing papers, it is necessary to know the number of students per class, the number of students per grade, and the total number of students in the school. For instance, in the case of copies or prints whose contents differ for every grade or whose contents are the same throughout the school, copied or printed sheets should be stacked for respective classes according to the number of students per class.

Thus, a table is usually shown in the vicinity of a copying or printing machine, which indicates the number of students per grade and per class in the shape of a matrix. Referring to the table, a teacher enters and registers the number of student data in the copying or printing machine, thereby producing a desired number of copies or prints. When obtaining the desired copies or prints, he or she inserts a slip sheet or the like in order to discriminate previous copies or prints from succeeding ones. Then, he or she starts producing new copies or prints.

Therefore, copying or printing may be usually performed with reduced efficiency. Further, the foregoing table is indispensable.

There has been an image producing apparatus which provides a class mode and a memory mode as well as an ordinary mode. The class mode is selected when producing a plurality of sets of copies or prints, each set having the same number of sheets. The memory mode can store a plurality of set numbers indicating different quantities of copies or prints to be produced. However, when the image producing apparatus is used in a school where respective classes are different from one another in the number of students, the class mode cannot be used. Further, since a number of teachers may operate the image producing apparatus one after another, it is troublesome to remember memory numbers in which respective classes are stored. In particular the class mode or memory mode is difficult and complicated to operate.

### SUMMARY OF THE INVENTION

The invention is designed to overcome the foregoing problems of the prior art and is intended for providing an image producing apparatus with control functions which enhance operability and efficiency when used in school.

According to a first aspect of the invention, there is provided an image producing apparatus which includes a control panel with a keypad, and is capable of selecting a school mode in which keys on the keypad are pressed for

selecting at least a particular class or grade, and numerical data concerning the number of students in each selected class or grade are extracted and registered as the number of prints.

In a second aspect of the invention, there is provided an image producing apparatus which includes a control panel with a keypad and a liquid crystal display, and is capable of selecting a school mode in which the liquid crystal display indicates, in the form of a matrix, numerical data concerning the number of students per class or per grade, one or a plurality of numerical data are extracted by a selection key, and the numerical data are registered as the number of prints.

According to any of the foregoing arrangements, when printing is performed for a plurality of classes or grades in the school mode, printed sheets are sorted in accordance with each class and grade.

Printing is performed first for a class having the largest class-grade identification code and is completed for a class having the smallest class-grade identification code, and printed sheets are discharged from the image producing apparatus in accordance with a printed order.

The keypad has numeric or alphanumeric keys. The control panel has a selector for selecting either a numeric or alphanumeric indication, and a display for indicating data in either numeric or alphanumeric form.

The control panel further includes a plus-1 key for registering the numerical data with one added.

In accordance with a third aspect of the invention, there is provided an image producing apparatus which includes a control panel with a liquid crystal display which indicates classes and grades in boxes, and is capable of selecting a school mode in which numerical data concerning the number of students in the selected boxes are registered as the number of prints when one or a plurality of boxes are selected by a selection key.

In the third aspect, when printing is performed for a plurality of classes or grades in the school mode, printed sheets are sorted in accordance with each class and grade.

According to a fourth aspect of the invention, there is provided an image producing apparatus which includes: data extracting means for extracting data concerning identification codes and numerical data concerning the number of members belonging to the respective identification codes, the numerical data being changeable; and a display for indicating the identification codes and the numerical data. The image producing apparatus is capable of selecting a special mode in which the numerical data are registered as the number of prints.

### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will become more fully understood from the detailed description given below and the accompanying drawings which are given by way of illustration only, and thus are not limiting of the present invention. In all Figures, identical parts have identical reference numbers.

FIG. 1 shows a control panel of an image producing apparatus to which a first embodiment of the invention is applicable.

FIG. 2 is a block diagram of a control unit of the image producing apparatus.

FIG. 3 is a table showing number-of-student data.

FIG. 4 shows an image on the display.

FIG. 5 shows a modified control panel in the first embodiment.

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FIG. 6 shows a control panel in a second embodiment when a school mode is selected.

FIG. 7 schematically shows a stencil duplicating machine to which the invention is applied.

FIG. 8 shows a control panel in a third embodiment when the school mode is selected.

FIG. 9 shows messages indicated on a liquid crystal display in the third embodiment.

FIG. 10 shows other messages indicated on the liquid crystal display in the third embodiment.

#### DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 7 shows an image producing apparatus, e.g., a stencil duplicating machine 30, to which the invention is applied. The stencil duplicating machine 30 has a well-known structure, and can select a class mode, a memory mode and so on as well as an ordinary mode. The stencil duplicating machine 30 mainly comprises a document reader 31, a stencil perforating section 32, a printing section 33, a stencil take-up section 34, a sheet feeding section 35, and a printed sheet discharging section 36.

The document reader 31 is present atop the stencil duplicating machine 30. The stencil perforating section 32 includes a platen roller 37, a thermal head 38, a pair of sheet feed rollers 39, a stencil cutter 40 and so on. The printing section 33 includes a printing drum 41, a press roller 42, an ink supply 43 and so on. The stencil take-up section 34 includes a stencil take-up unit 44, a used stencil receptacle 45, and so on. The sheet feeding section 35 includes a sheet feed roller 46, a separating roller 47, a pair of register rollers 48, a sheet tray 49 for stacking printing sheets P thereon, and so on. The printed sheet discharging section 36 includes a printed sheet conveyor 50, a separating claw 51, a printed sheet tray 52, a tape cutter 53, and so on.

The stencil duplicating machine 30 also comprises a control unit 10, an image data processing unit 11, a storage 12, a main motor driver 13, a stencil perforation driver 14, a stencil take-up driver 15, and so on, all of which are positioned at a lower part in the machine 30.

The main motor driver 13 controls the operation of the printing drum 41, the press roller 42, the sheet feed roller 46, the register roller pair 48, the printed sheet conveyor 50, and the tape cutter 53. The stencil perforation driver 14 controls the operation of the platen roller 37, the thermal head 38, the feed roller pair 39, and the stencil cutter 40. The stencil take-up driver 15 controls the operation of the stencil take-up unit 44.

FIG. 1 shows part of a control panel 1 of the stencil duplicating machine 30 in the first embodiment. The control panel 1 is positioned on a top panel of the stencil duplicating machine 30, and includes operation keys such as a stencil perforation start key, a print start key, a trial print key and a stop key (which are not shown), a variety of mode setting keys (not shown), a numeric keypad 2 as a data extracting member, a school mode key 3 (as a special mode selecting key), an all-class key 4, an all-grade key 5, a (+1) key 6, an update key 7, an enter key 8, and an 8-digit LED display 9 for indicating each digit in seven segments. The control panel 1 is connected to the control unit 10.

The control unit 10 of the stencil duplicating machine 30 is constituted by circuit blocks as shown in FIG. 2, and is a well-known microcomputer mainly including a CPU, a ROM, and a RAM.

The control unit 10 receives not only an image data signal, which is read by the document reader 31 and undergoes

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analog/digital conversion and other processing by the image processing unit 11, but also an operation signal and a data signal from the control panel 1. The control unit 10 provides indication data to the control panel 1. In response to these signals, the control unit 10 starts an operation program of the stencil duplicating machine 30, stored in the storage 12, and issues operation commands to the main motor driver 13, stencil perforation driver 14 and stencil take-up driver 15. The drivers 13, 14 and 15 actuate their related actuators. The stencil duplicating machine 30 then performs a series of operations, i.e., perforates a stencil, feeds sheets, prints sheets, feeds printed sheets, and takes up a used stencil.

The storage 12 stores not only programs for operating the actuators of the main motor driver 13, stencil perforation driver 14, and stencil take-up driver 15 but also numerical data concerning the number of students per class in a school mode, as shown in FIG. 3. The programs are prepared for a plurality of printing conditions. The storage 12 stores the number of students per class at each address. For example, "30" for Class 1-1 is stored at an address 1, and "28" for Class 1-2 at the address 2.

In operation, an operator places an original on the document reader 31, and presses the stencil perforation start key (not shown) on the control panel 1. Image data read by the document reader 31 are converted by the image data processing unit 11, and are supplied to the control unit 10 as the image data signal. Simultaneously, the operation commands for the stencil take-up and stencil perforation are provided to the stencil duplicating machine 30 by the control unit 10.

In response to these signals, the control unit 10 supplies the operation commands to the main motor driver 13, stencil perforation driver 14, and stencil take-up driver 15, respectively. The stencil take-up unit 44 is operated so as to peel an existing used stencil from a surface of the printing drum 41. The peeled stencil is discharged into the used stencil receptacle 45. In response to the image data signal from the image data processing unit 11, the control unit 10 heats heat emitting elements of the thermal head 38 so that a new stencil is perforated. In this state, both the platen roller 38 and a pair of stencil feed rollers 39 are operated. The perforated fresh stencil is wrapped on the outer surface of the printing drum 41 which is free from the used stencil. Thus, the stencil duplicating machine 30 finishes the stencil take-up and stencil perforation operations, and is ready for a printing operation.

The printing operation in the school mode will be described hereinafter. When the stencil duplicating machine 30 is ready for the printing operation, the operator presses the school mode key 3 on the control panel 1. In response to the operation signal from the control panel 1, the control unit 10 calls the operation program for establishing the school mode. The school mode key 3 will be pressed again in order to cancel the school mode.

It is assumed here that Class 1-1 will be selected. First of all, the operator presses a numeric key "1" twice on the numeric keypad 2, thereby selecting Class 1-1. A data signal indicative of selected Class 1-1 is sent to the control unit 10. In response to this data signal, the control unit 10 calls a number-of-student data (i.e., numerical data) "30" (i.e., the number of students in a hypothetical class) from the address 1 associated with Class 1-1 in the storage 12. On the control panel 1, the display 9 indicates a message "1-1 30" as shown in FIG. 4. Thus, "30" is registered as the number of prints to be produced.

The operator then presses the print start key (not shown) on the control panel 1. The operation signal is sent to the

control unit 10 from the control panel 1. The control unit 20 issues the operation command to the main motor driver 13. This operation command activates the sheet feed roller 46, the register roller pair 48, the printing drum 41, the press roller 42, and the printed sheet conveyor 50. Print sheets P from the sheet feeding section 35 have an image printed thereon, are transported by the printed sheet conveyor 50 to the printed sheet tray 52, and are stacked thereon. The printed sheet tray 52 is present outside the stencil printing machine 30. When counters (not shown) in the printing section 33 and the sheet feeding section 35 count the registered number of printed sheets, the control unit 10 provides a stop signal to the main motor driver 13, thereby interrupting the printing operation.

In the foregoing operation, if numeric keys "1" and "2" are erroneously pressed on the numeric keypad 2 instead of pressing the numeric key "1" twice for selecting Class 1-1, the display 9 will indicate a message "1-2 28". In such a case, the school mode key 3 is pressed so as to temporarily cancel the school mode. Then, the school mode key 3 is pressed again, and the correct numeric key "1" is pressed twice on the numeric keypad 2 in order to select Class 1-1. Alternatively, it is also possible to press a clear key (not shown), and restart the procedure from the beginning.

The following describe the operation for producing prints for Classes 1-1 to 1-4 in the first grade, with reference to FIGS. 1 and 3.

The operator presses the numeric key "1" on the numeric keypad 2, and the all-class key 4. The data signal and the operation signal indicative of this state are sent to the control unit 10. In response to these signals, the control unit 10 calls, from the storage 12, the number-of-student data "31" for Class 1-4, and provides the indication data to control panel 1. On the control panel 1, the display 9 indicates a message "1-431". Thus, "31" is registered as the number of prints to be produced.

Thereafter, the operator presses the print start key (not shown). The operation signal is sent to the control unit 10 from the control panel 1. The operation command from the control unit 10 activates the sheet feed roller 46, the register roller pair 48, the printing drum 41, the press roller 42, and the printed sheet conveyor 50. Thus, the stencil printing machine 30 keeps on producing prints until the counters in the printing section 33 and the sheet feeding section 35 count the registered number of prints. When the printed sheets reach the registered number, the control unit 10 issues the operation command. In response to the operation command, the tape cutter 53 operates so as to cut a tape and stick it onto the top of printed sheets on the printed sheet tray 52. Concurrently, the control unit 10 issues the stop signal to the main motor driver 13, so that the printing operation is temporarily interrupted.

After the temporary interruption of the printing operation, the control unit 10 calls, from the storage 12, the number-of-student data "32" for Class 1-3. On the control panel 1, the display 9 indicates a message "1-3 32". "32" is registered as the number of prints to be produced. The printing operation is repeated until 32 printed sheets are obtained. When the desired number of printed sheets is obtained, the tape cutter 53 operates. Then, the printing operation will be temporarily interrupted.

The control unit 10 then calls, from the storage 12, the number-of-student data "28" for Class 1-2. The display 9 indicates a message "1-2 28". "28" is registered as the number of prints to be produced. The tape cutter 53 operates when the stencil duplicating machine 30 produces 28 prints.

Thus, the printing operation is temporarily interrupted. Thereafter, the control unit 10 calls, from the storage 12, the number-of-student data "30" for Class 1-1. The display 9 indicates a message "1-1 30". "30" is registered as the number of prints to be produced. The printing operation is continued until 30 prints are produced. Then, the whole printing operation will be completed.

The printed sheet tray 52 houses a total of 121 printed sheets, i.e. the 30 printed sheets for Class 1-1, the 28 printed sheets for Class 1-2 with the cut tape, the 32 printed sheets for Class 1-3 with the cut tape, and the 31 printed sheets for Class 1-4 with the cut tape are stacked on top of each other. The 30 printed sheets for Class 1-1 are at the top . . . , and the 31 printed sheets for Class 1-4 at the bottom on the printed sheet tray 52.

In order to produce prints for all the classes in the second grade, the numeric key "2" is pressed on the numeric keypad 2, followed by the all-class key 4 and the print start key. The printing operation will be performed as described above. The numeric keys "3" will be pressed on the numeric keypad 2 in order to produce prints for the classes in the third grade. The all-class key 4 and the print start key will be then pressed.

It is assumed here that prints will be produced for all the classes (e.g. classes 1-1 to 3-4) in the first to third grades throughout the school.

The operator presses the all-grade key 5. The operation signal indicative of this is sent to the control unit 10. In response to the operation signal, the control unit 10 calls, from the storage 12, the number-of-student data "32" for Class 3-4 (shown in FIG. 3), and provides the indication data to the control panel 1. On the control panel 1, the display 9 indicates a message "3-4 32". "32" is registered as the number of prints to be produced.

Thereafter, the print start key will be pressed, so that prints will be sequentially produced from Class 3-4, Class 3-3, . . . to Class 1-1. When the prints for Class 1-1 are obtained, the printing operation will be completed. The printed sheet tray 52 houses a total of 369 printed sheets, i.e., the 30 prints for Class 1-1, the 28 prints for Class 1-2, . . . , the 32 prints for Class 3-4 are stacked thereon with the tapes interposed between the prints for the respective classes. In this case, the prints for Class 3-4 are at the bottom, . . . , and those for Class 1-1 are at the top.

The (+1) key 6 is operated in order to produce the registered number of prints (in accordance with the number-of-student data for each class stored in the storage 12) and one additional print. When the (+1) key 6 is pressed, the control unit 10 always calls, from the storage 12, the number-of-student data added by one. Thus, prints will be produced with one extra print, which may be used for a teacher in charge of the class.

For instance, the operator presses the numeric key "1" twice on the numeric keypad 2, and the (+1) key 6, thereby selecting Class 1-1. The data signal and the operation signal indicative of this state are sent to the control unit 10. The control unit 10 then calls, from the storage 12, the number-of-student data "30" from the address 1 associated with Class 1-1. The control unit 10 provides "30" to the control panel 1, and adds "1" to the number-of-student data "30". On the control panel 1, the display 9 indicates the message "1-1 30", which is changed to a message "1-1 31" in response to the indication data from the control unit 10. This is because the (+1) key 6 has been pressed. Thus, "31" is registered as the number of prints to be produced. Following the print start key, the printing operation will be performed as described above.

It is assumed that the numeric key "1" on the numeric keypad 2, the all-class key 4 and the (+1) key 6 are pressed in succession. The control unit 10 calls, from the storage 12, the number-of-student data "31" for Class 1-4, and adds one to "31". On the control panel 1, the display 9 changes its message "1-4 31" to a message "1-4 32". Thus, "32" is registered as the number of prints to be produced.

The print start key is pressed, so that the printing operation is performed until the counters count the registered number "32". In response to the operation command from the control unit 10, the tape cutter 53 is activated and sticks a cut tape onto a top printed sheet on the printed sheet tray 52. The printing operation is temporarily interrupted. Thereafter, the control unit 10 calls, from the storage 12, the number-of-student data "32" for Class 1-3, and provides indication data "32+1" to the control panel 1. The display 9 indicates a message "1-3 33" on the control panel 1. Thus, "33" is registered as the number of prints to be produced. The printing operation is performed as described above until 33 prints are produced. The tape cutter 53 is then operated, and the printing operation is temporarily interrupted. Thereafter, the printing operation is performed to produce 29 (=28+1) prints for Class 1-2. Similarly, the printing operation is further performed to produce 31 (=30+1) prints for Class 1-1. Then, the printing operation will be completed.

It is also possible to increase the number of prints to be produced with an additional print only for a particular class. For example, if the (+1) key 6 is pressed while the display 9 indicates the message "1-4 31" after pressing the numeric key "1" on the numeric keypad 2 and the all-class key 4 in succession, the number of prints to be produced only for Class 1-4 can be increased to 32.

When the printing operation under the (+1) mode is completed for all the classes in the first grade, the printed sheet tray 52 houses a total of 125 prints thereon, i.e., the 31 prints for Class 1-1, a first tape, the 29 prints for Class 1-2, a second tape, the 33 prints for Class 1-3, a third tape, and the 32 prints for Class 1-4 are stacked on top of each other. The prints for Class 1-1 are at the top and those for Class 1-4 are at the bottom on the printed sheet tray 52.

If the (+1) key 6 is used together with the all-grade key 5, "1" is added to each registered number of prints of all the classes throughout the school similarly to the printing operation with the all-class key 4 and the (+1) key 6 pressed in succession.

The number-of-student data can be updated as follows when there are some changes in the number of students.

First of all, the operator presses the school mode key 3 so as to set up the school mode. The update key 7 is then pressed. The control unit 10 calls, from the storage 12, the number-of-student data of Class 1-1, and provides the indication data to the control panel 1. On the control panel 1, the display 9 indicates the message "1-1 30". The value "30" blinks, which represents that the control unit 10 is ready for updating the number-of-student data. In this state, the operator presses the numeric keys "2" and "8" on the numeric keypad 2, and then presses the enter key 8. "28" blinks on the display 9. The enter key 8 is then pressed again, so that the number-of-student data of Class 1-1 is updated to "28".

Thereafter, the display 9 indicates the message "1-2 28". The value "28" blinks. If it is not necessary to change "28", the operator presses the enter key 8. The display 9 indicates the message "1-2 28" in a steady manner.

Next, the display 9 indicates the message "1-3 32". "32" blinks on the display 9. In this state, if necessary, the number-of-student data "32" will be updated in accordance

with a new number of students in Class 1-3 in the similar manner to that mentioned above.

The update key 7 is pressed again after number-of-student data are updated. Thus, the stencil duplicating machine 30 goes out from the update mode, and resumes the school mode.

Further, it is also possible to update the number-of-student data of a particular class, e.g. Class 1-2, by pressing the update key 7 after pressing "1" and "2" on the numeric keypad 2.

FIG. 5 shows a control panel 16 used in a modified example of the first embodiment. The control panel 16 is substantially identical to the foregoing control panel 1, but differs therefrom in the following points. Specifically, the control panel 16 includes an alphanumeric keypad 17, and a liquid crystal display 18 which can indicate letters as well as numerals.

Either numerals or letters can be selectively entered by operating a selector switch (not shown) of the stencil duplicating machine 30. Specifically, the control unit 10 controls the alphanumeric keypad 17 so that letters can be entered only to indicate the classes in the school mode.

When the selector switch is set to the letters, the operator presses alphanumeric keys "3/C" and "1/A". In response to data signal from the control panel 16, the control unit 10 recognizes that Class 3-A is designated, and calls the number-of-student data (e.g., 30) of the Class 3-A from the storage 12. The indication data is supplied to the control panel 16, which makes the liquid crystal display 18 indicate a message "3-A 30". The value "30" is registered as the number of copies or prints to be produced. The selector switch is operated in multiple steps in order to indicate all of the letters.

In a second embodiment of the invention, a control panel 19 in the school mode has an appearance as shown in FIG. 6. This control panel 19 is substantially identical to the control panel 1 in the first embodiment, but differs from the control panel 1 in that an LCD touch screen 20 is employed in place of the display 9.

The LCD touch screen 20 has a well-known structure. In the ordinary mode, the LCD touch screen 20 usually indicates the number of copies or prints to be produced, printing speed data, printing density data, and so on.

When the school mode key 3 is pressed, the control unit 10 issues the data indicative of the school mode and calls the number-of-student data from the storage 12. The number-of-student data are indicated in the form of a matrix on the LCD touch screen 20. Specifically, on the LCD touch screen, when touched, each box functions as a selection key as described hereinafter.

In operation, when producing prints for Class 1-1, the operator touches, on the LCD touch screen 20, a box "30" corresponding to Class 1-1. Then, the box "30" is indicated in reverse video on the LCD touch screen 20, so that "30" is registered as the number of prints to be produced. The operator presses the print start key. Thereafter, the stencil duplicating machine 30 produces prints as in the first embodiment.

The following describe a special case in which prints are produced for Class 1-1 and Class 3-2 in succession.

The operator touches boxes "30" and "29" for these classes in turn. The boxes "30" and "29" are indicated in reverse video on the LCD touch screen 20. The number-of-student data "30" and "29" are registered as the number of prints to be produced. The print start key is pressed, so that

the stencil duplicating machine 30 produces 29 prints for Class 3-2. The 29 prints are stacked on the printed sheet tray 52 with a tape stuck on the top sheet. After temporarily suspending its operation, the stencil duplicating machine 30 resumes producing 30 prints for Class 1-1.

When it is necessary to successively produce prints for a plurality of classes, the printing operation will be started for a class having the largest class-grade identification code first and be repeated for the remaining classes one after another. This means that the prints for the class whose class-grade identification code is the smallest is atop the prints for the other classes on the printed sheet tray 52, which facilitates sorting.

In order to obtain prints for all the students in the first grade, the operator touches the box "121" indicative of a sub total. The box "121" is then indicated in reverse video, so that "121" is registered as the number of prints to be produced. Thereafter, the print start key is pressed, and the box "31" related to Class 1-4 is indicated in reverse video. When 31 prints are produced, a tape is stuck on the top sheet, and the printing operation will be temporarily suspended.

The box "31" returns to normal video. Then, the box "32" related to Class 1-3 is indicated in the reverse video. After producing 32 prints, a tape is stuck onto the top sheet, and the printing operation is temporarily suspended. Prints for Classes 1-2 and 1-1 will be produced in a similar manner. The box "121" remains in reverse video until all of 121 prints are obtained. When all the printing operation is complete, the box "121" returns to normal video.

Prints for all the students throughout the school will be produced in the following manner. The operator touches the grand total box "369" on the LCD touch screen 20, so that this box is indicated in reverse video. The number-of-student data "369" is registered as the number of prints to be produced. The print start key is pressed. The box "32" related to Class 3-4 is indicated in reverse video. After producing 32 prints, a tape is attached to the top sheet. Then, the printing operation is temporarily suspended. The box "32" returns to normal video.

The foregoing operation is repeated until 30 prints are produced for the Class 1-1. During the printing operation, the box "369" remains in reverse video. When all of 369 prints are obtained, the box "369" returns to normal video.

The printing operation with the (+1) key 6 will be performed as follows. The operator touches the box "30" for the Class 1-1 on the LCD touch screen 20. When the (+1) key 6 is pressed after the box "30" is indicated in reverse video, an operation signal indicative of this is supplied to the control unit 10. Thus, the control unit 10 updates the number-of-student data "30" to "31". The data "31" is registered as the number of prints to be produced. The sub-total "121" is updated to "122". Thereafter, the print start key is pressed to produce prints as described above.

It is assumed here that the (+1) key 6 is pressed after touching the sub-total box "121". The operation signal indicative of the operation of the (+1) key 6 is supplied to the control unit 10. The control unit 10 updates the number-of-student data "121" to "125". The box "125" is indicated in reverse video. Thus, "125" is registered as the number of prints to be produced. The number-of-student data "30", "28", "32" and "31" (related to the classes in the first grade) are respectively updated to "31", "29", "33" and "32". When the print start key is pressed, the box "32" for Class 1-4 is indicated in reverse video. Thereafter, the printing operation will be performed as described previously.

When the (+1) key 6 is pressed after the grand total box "369" is touched and is indicated in reverse video, one (1)

is added to every class throughout the school. The number-student-data each with plus 1 are registered as the number of prints to be produced.

The stored data will be updated as described hereinafter. First of all, the school mode is selected by the school mode key 3. The update key 7 is then pressed. The control unit 10 provides the indication data to the control panel 19. On the LCD touch screen 20, the box "30" for Class 1-1 is indicated in the reverse video, which makes the control unit 10 ready for receiving new number-of-student data for Class 1-1. In this state, the operator presses the numeric keys "2" and "8" on the numeric keypad 2, and the enter key 8. The box "30" is changed to "28" on the LCD touch screen 20. When the enter key 8 is pressed again, the number-of-student data "30" is updated to "28", and the box "28" returns to normal video.

Next, the box "28" for Class 1-2 is indicated in the reverse video. If no change is necessary, the operator presses the enter key 8 without pressing any numerical key on the numeric keypad 2. The box "28" returns to normal video.

The box "32" related to Class 1-3, and the box "31" for Class 1-4 are indicated in the reverse video in succession as described above. In this state, the update key 7 is pressed, so that the update mode is completed, and the school mode is resumed. Needless to say, the number-of-student data of a particular class can be updated as in the first embodiment.

In the second embodiment, it is possible to selectively enter numerals or alphabets using the alphanumeric keypad 17 (shown in FIG. 5) and the selector switch (not shown) provided in the stencil duplicating machine 30.

FIG. 8 shows a control panel 21 used for the school mode in a third embodiment of the invention. The control panel 21 differs from the control panel 19 (shown in FIG. 6) only in that it includes a 5-digit-7-segment LED 22, a liquid crystal display 23 and a scroll key 24 as a data extracting member.

The liquid crystal display 23 can indicate data in approximately three rows, but does not have the touch-screen function. Thus, the display 23 is less expensive than the LCD touch screen 20. The display 23 usually indicates data such as a printing speed and operating states of the printing machine.

Referring to FIG. 8, when the school mode key 3 is pressed, the liquid crystal display 23 indicates a plurality of boxes having grade-class data. First of all, the box related to data stored at the first address (e.g. "1-1" denoting the class 1 in the first grade) is indicated in reverse video. Each time the scroll key 24 is pressed, each box is indicated in reverse video one after another in accordance with a direction of a pressed mark on the scroll key 24. When the enter key 8 is pressed after a box of the desired class (e.g., "1-3") is indicated in reverse video, the 7-segment LED 22 indicates the number-of-student data "32" (which is changeable) for Class 1-3. The data "32" is confirmed. In this state, the print start key is pressed, so that 32 prints will be produced.

The following describes how prints for Classes 1-1 to 1-4 are produced and stacked. First of all, the box "1-1" is selected by operating the scroll key 24, and is indicated in reverse video. The enter key 8 is pressed, so that the 7-segment LED 22 indicates the number-of-student data "30". Next, the scroll key 24 is pressed so as to select the box "1-2" and indicate it in reverse video. In this state, since "30" for Class 1-1 has been confirmed, the box "1-1" remains in reverse video. When the enter key 8 is pressed, the 7-segment LED 22 then changes its indication "30" to "28". Similarly, the boxes "1-3" and "1-4" are indicated in reverse video, and the number-of-student data of these

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classes are confirmed by pressing the enter key 8. Finally, the print start key will be pressed, so that 31 prints for Class 1-4, 32 prints for Class 1-3, 28 prints for Class 1-2, and 30 prints for Class 1-1 are automatically produced and stacked on the printed sheet tray 52 in the foregoing order.

In the foregoing confirming process, it is also possible to extract the number-of-student data of only the desired classes by pressing the scroll key 24 and by skipping unnecessary number-of-student data without pressing the enter key 8.

The liquid crystal display 23 has the boxes arranged only in three rows. In order to indicate the number-of-student data stored for all the classes as shown in FIG. 9 or FIG. 10, the scroll key 24 is pressed at its lower part while the box "3-1", "3-2", "3-3" or "3-4" remains in reverse video, or while the box "1-4", "2-4" or "3-4" remains in reverse video on the leftmost column.

In this embodiment, it is also possible to indicate the classes with "1-A", "1-B" and so on by selectively operating the selector switch as in the modified example of the first embodiment, or to indicate data such as "All classes in grade 1", or "All classes throughout school".

In the foregoing embodiments, the image producing apparatus is assumed to be applied to an institution such as school. When producing prints in such an institution, the number-of-student data, which are stored in the addresses (of the storage) corresponding to the identification codes in accordance with classes and grades in the school, are selectively extracted from the storage, and are registered as the number of prints to be produced. Such data can be updated in accordance with any change in classes or grades. However, the invention is also applicable to a firm, a company or the like. In such a case, number-of-employee data in sections and departments may be used to register the number of prints to be produced in a special mode in place of the foregoing school mode.

The invention is applicable to an electrophotographic copying machine as well as the stencil duplicating machine.

According to the invention, when the image producing apparatus is used in the school mode, the number-of-student data stored therein is selectively extracted and is registered as the number of prints to be produced. Thus, the desired number of prints or copies can be obtained in accordance with the number-of-student data. This is effective in improving the efficiency of the printing or copying operation and in reducing a printing or copying cost.

What is claimed is:

1. An image producing apparatus comprising:

a control panel with a keypad;

at least three modes of operation;

mode selection means for selecting a school mode of operation in which keys on the keypad are pressed for selecting at least a particular class or grade;

means for extracting from a memory numerical data concerning a number of students in each selected class or grade;

means for registering the numerical data as a number of prints;

wherein when printing is performed for a plurality of classes and grades in the school mode, printed sheets are sorted in accordance with each class and grade.

2. An image producing apparatus comprising:

a control panel with a liquid crystal display touch screen which indicates classes and grades in boxes;

at least three modes of operation;

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mode selection means for selecting a school mode of operation in which the liquid crystal display touch screen indicates, in the form of a matrix, numerical data concerning the number of students per class or per grade;

means for extracting one or a plurality of numerical data by touching boxes on the liquid crystal display touch screen;

means for registering the numerical data as a number of prints;

wherein when printing is performed for a plurality of classes and grades in the school mode, printed sheets are sorted in accordance with each class and grade.

3. The image producing apparatus according to claim 1 or 2, wherein printing is performed first for a class having the largest class-grade identification code and is completed for a class having the smallest class-grade identification code, and printed sheets are discharged from the image producing apparatus in accordance with a printed order.

4. The image producing apparatus according to claim 1 or 2, wherein the keypad has numeric or alphanumeric keys, the control panel has a selector for selecting either a numeric or alphanumeric indication, and a display for indicating data in either numeric or alphanumeric form.

5. The image producing apparatus according to claim 1 or 2 wherein the control panel further includes a plus-1 key for registering the numerical data with one added.

6. An image producing apparatus comprising a control panel with a liquid crystal display which indicates classes and grades in boxes;

at least three modes of operation;

mode selection means for selecting a school mode of operation in which when one or a plurality of boxes are selected by a selection key, numerical data concerning the number of students in the selected boxes are registered as the number of prints;

wherein when printing is performed for a plurality of classes and grades in the school mode, printed sheets are sorted in accordance with each class and grade.

7. An image producing apparatus comprising:

a control panel with a keypad;

at least three modes of operation:

mode selection means for selecting a special mode of operation;

means for extracting from a memory numerical data defined by first and second parameters, and the numerical data representing quantity and being updatable;

a display for indicating the first and second parameters and the numerical data;

means for registering the data as a number of prints;

wherein when printing is performed in the special mode for a plurality of groups defined by said first and second parameters, printed sheets are sorted in accordance with both first and second parameters.

8. An image producing apparatus according to claim 1, further comprising an all-class key for selecting all of the classes in a particular grade,

wherein when printing is performed after the all class key is selected, printed sheets are sorted in accordance with each class in the grade.

9. An image producing apparatus according to claim 8, further comprising an all-grade key for selecting all of the classes in all of the grades.

10. An image producing apparatus according to claim 2, further comprising a sub total box for selecting all of the classes in a particular grade,

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wherein when printing is performed after the sub total box is selected, printed sheets are sorted in accordance with each class in the grade.

11. An image producing apparatus according to claim 10, further comprising a grand total box for selecting all of the classes in all of the grades. 5

12. An image producing apparatus according to claim 6, further comprising a sub total box for selecting all of the classes in a particular grade,

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wherein when printing is performed after the sub total box is selected, printed sheets are sorted in accordance with each class in the grade.

13. An image producing apparatus according to claim 12, further comprising a grand total box for selecting all of the classes in all of the grades.

\* \* \* \* \*



UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : 5,881,336  
DATED : March 9, 1999  
INVENTOR(S) : Mitsuo Sato

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Title page, item [57], Abstract, line 5, change "and" to --or--.

Column 7, line 40, change "ate" to --are--;

Signed and Sealed this  
Fourteenth Day of November, 2000

Attest:



Q. TODD DICKINSON

Attesting Officer

Director of Patents and Trademarks



US005500717A

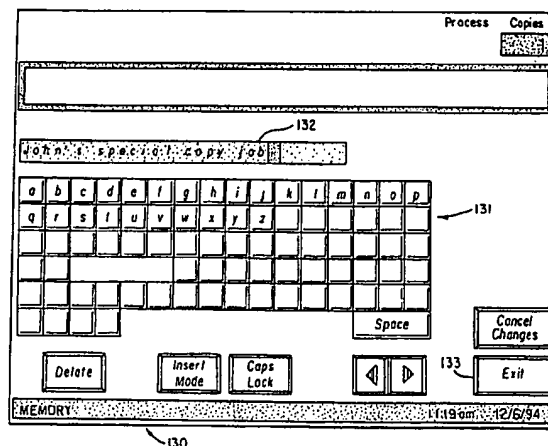
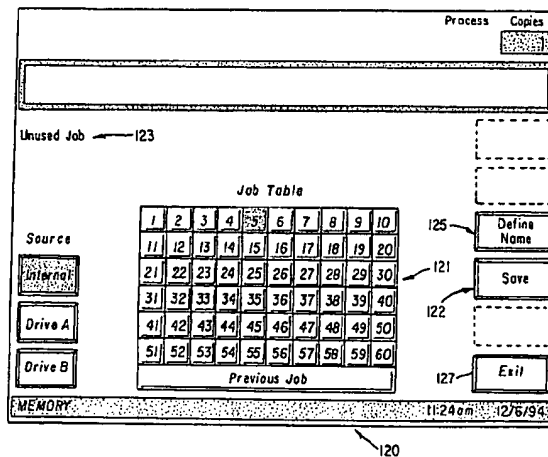
**United States Patent** [19]**Altrieth, III**[11] **Patent Number:** **5,500,717**[45] **Date of Patent:** **Mar. 19, 1996**[54] **JOB STORAGE/RETRIEVAL SYSTEM AND METHOD FOR REPRODUCTION APPARATUS**[75] **Inventor:** **Frederick E. Altrieth, III**, Scottsville, N.Y.[73] **Assignee:** **Eastman Kodak Company**, Rochester, N.Y.[21] **Appl. No.:** **398,467**[22] **Filed:** **Mar. 3, 1995**[51] **Int. Cl.<sup>6</sup>** ..... **G03G 21/00**[52] **U.S. Cl.** ..... **355/209; 345/173; 345/185; 364/188**[58] **Field of Search** ..... **355/204, 209, 355/210, 203; 364/188, 189; 345/116, 141, 146, 168, 173, 185**[56] **References Cited****U.S. PATENT DOCUMENTS**

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**Primary Examiner—R. L. Moses****Attorney, Agent, or Firm—Lawrence P. Kessler**[57] **ABSTRACT**

Reproduction apparatus having an improved system for storage and retrieval of a job setup comprising job selected operating features. The apparatus has a display device on which are addressed a features selection screen(s), a job store/retrieve memory screen and a job naming screen. The job naming screen comprises alpha numeric characters, selectable by the operator touch address, to define a word/phrase job name, which is stored in apparatus memory together with the related job operating features signals and a job code number.

**14 Claims, 17 Drawing Sheets**

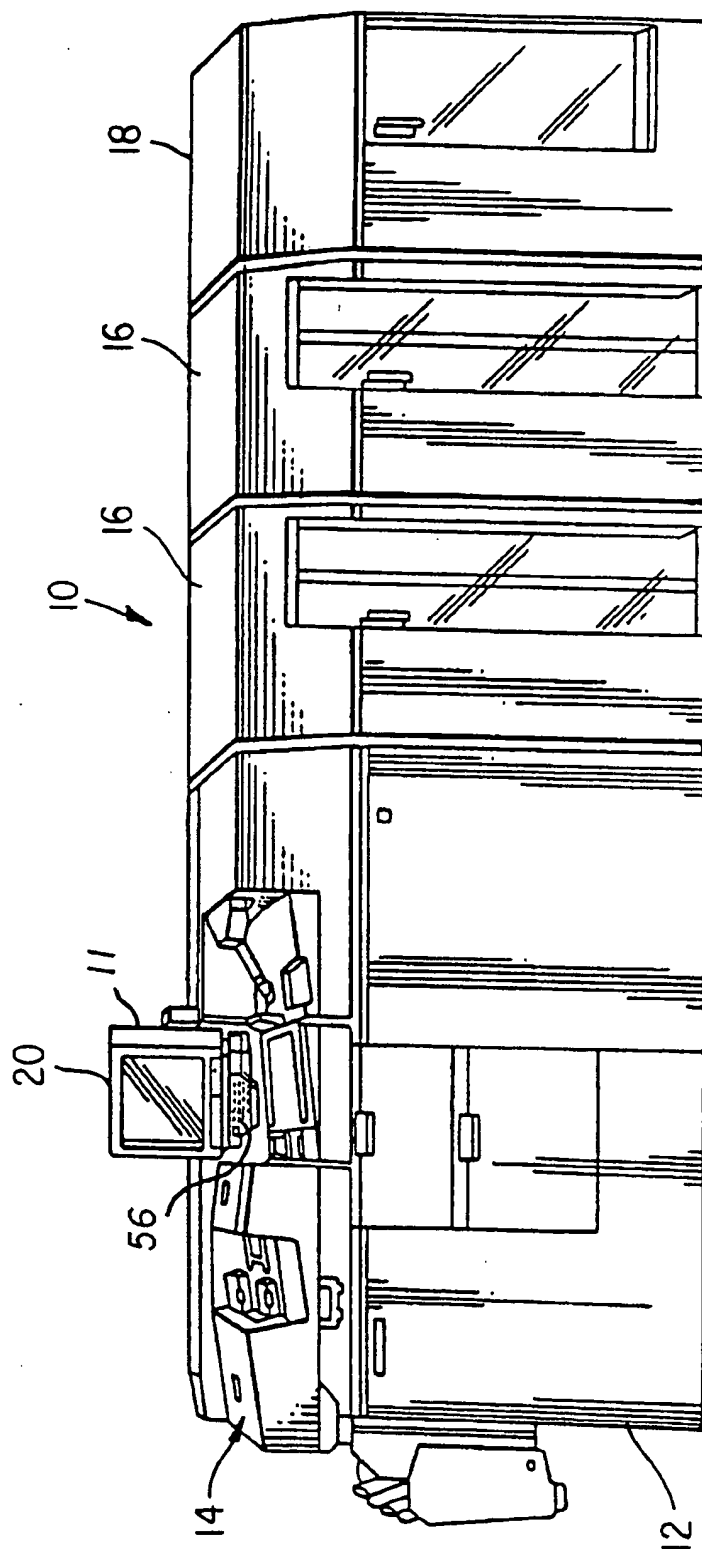


FIG. 1

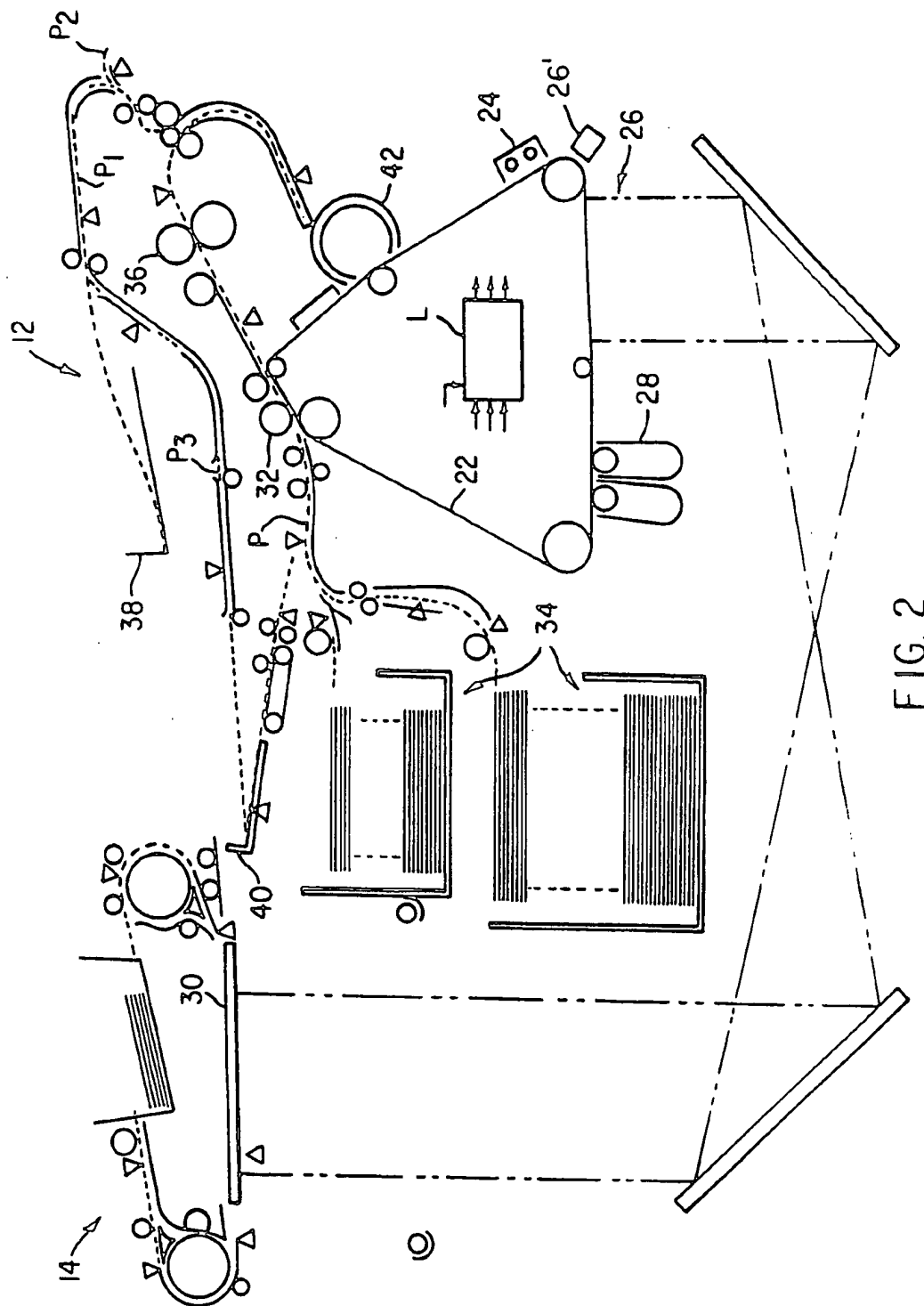


FIG. 2

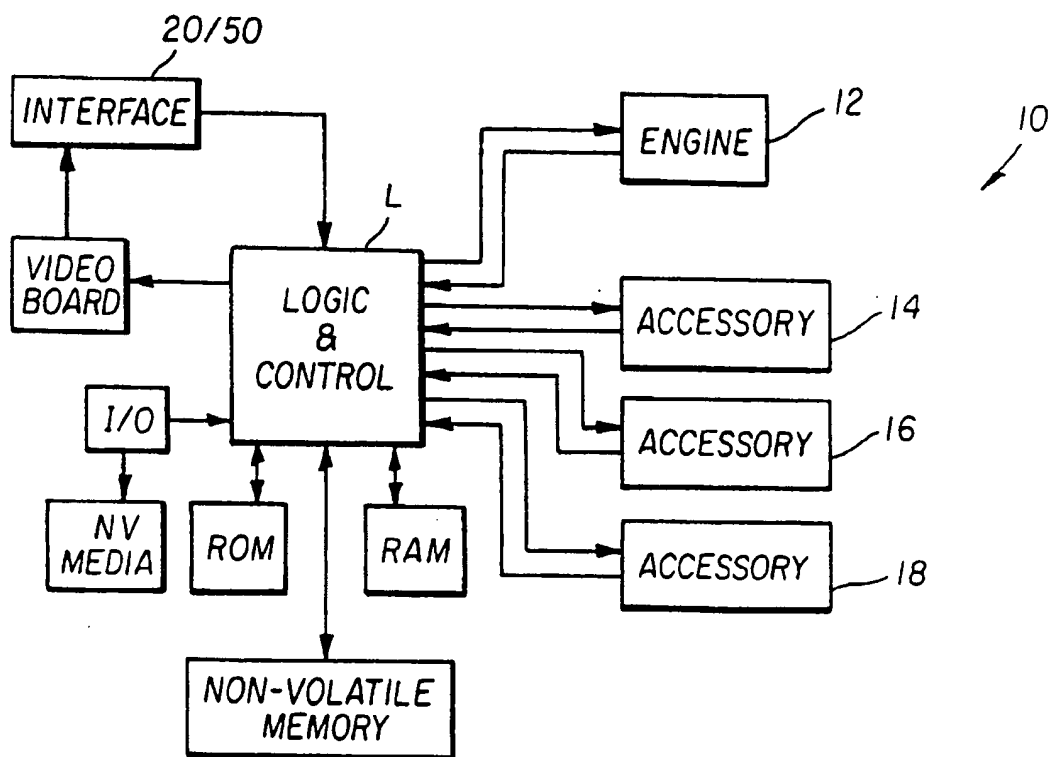


FIG. 3

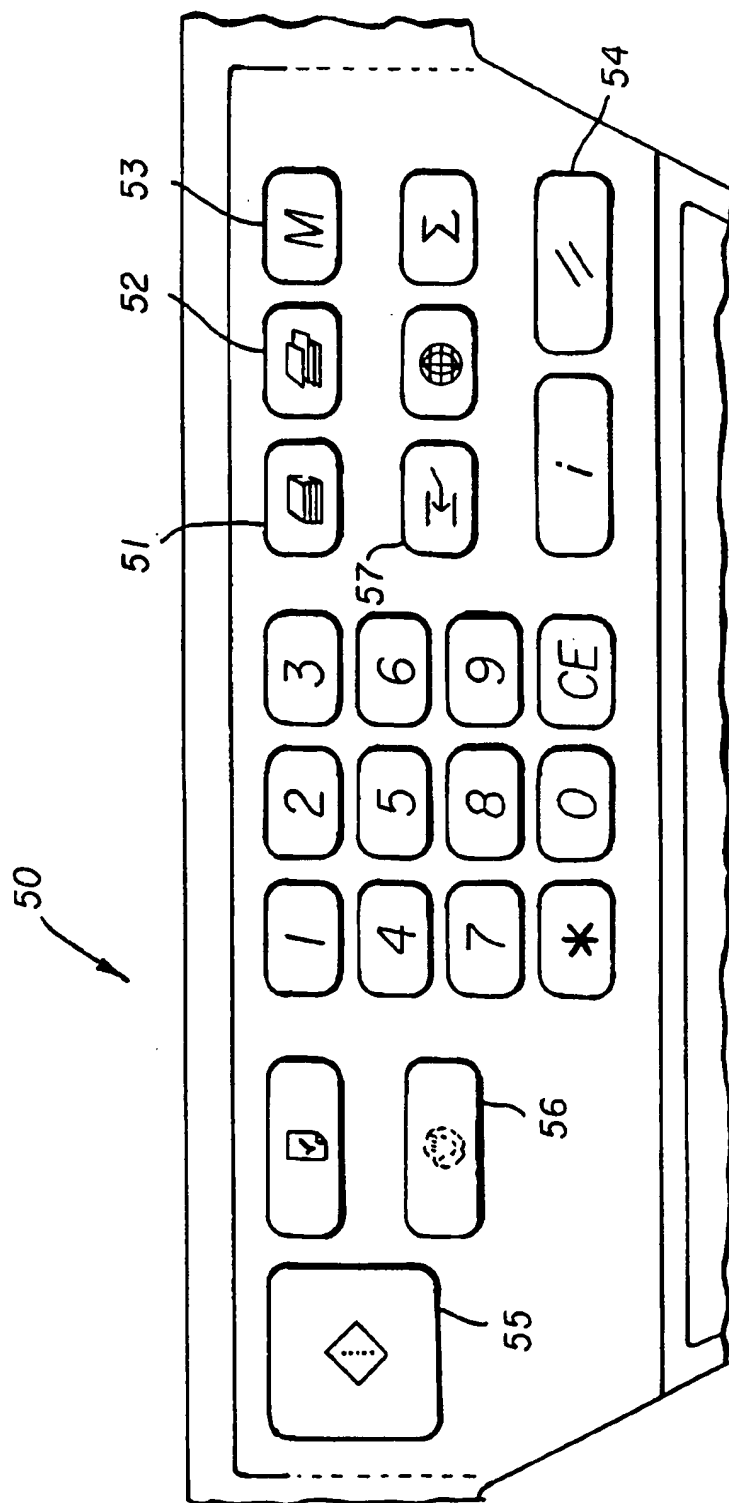
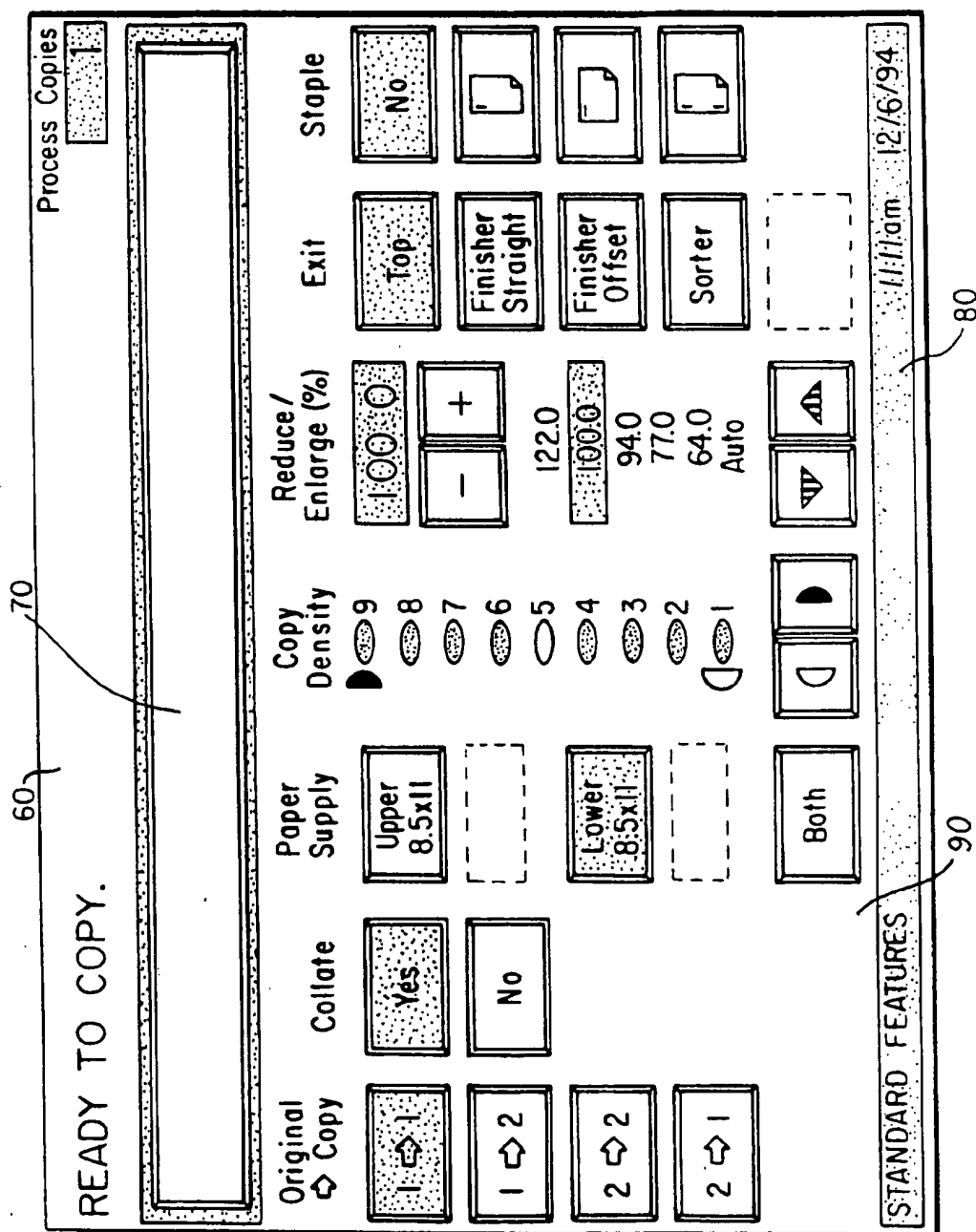


FIG. 4



60

70

80

90

READY TO COPY

Process Copies 1

Original Copy	Collate	Paper Supply	Copy Density	Reduce/Enlarge (%)	Exit	Staple
1 → 1	Yes	Upper 8.5x11	9	100.0	Top	No
1 → 2	No		8	-	Finisher Straight	
2 → 2		Lower 8.5x11	7	+	Finisher Offset	
2 → 1			6	122.0		
			5	100.0		
			4	94.0		
			3	77.0		
			2	64.0		
			1	Auto		

STANDARD FEATURES 11/12 am 12/6/94

FIG. 6



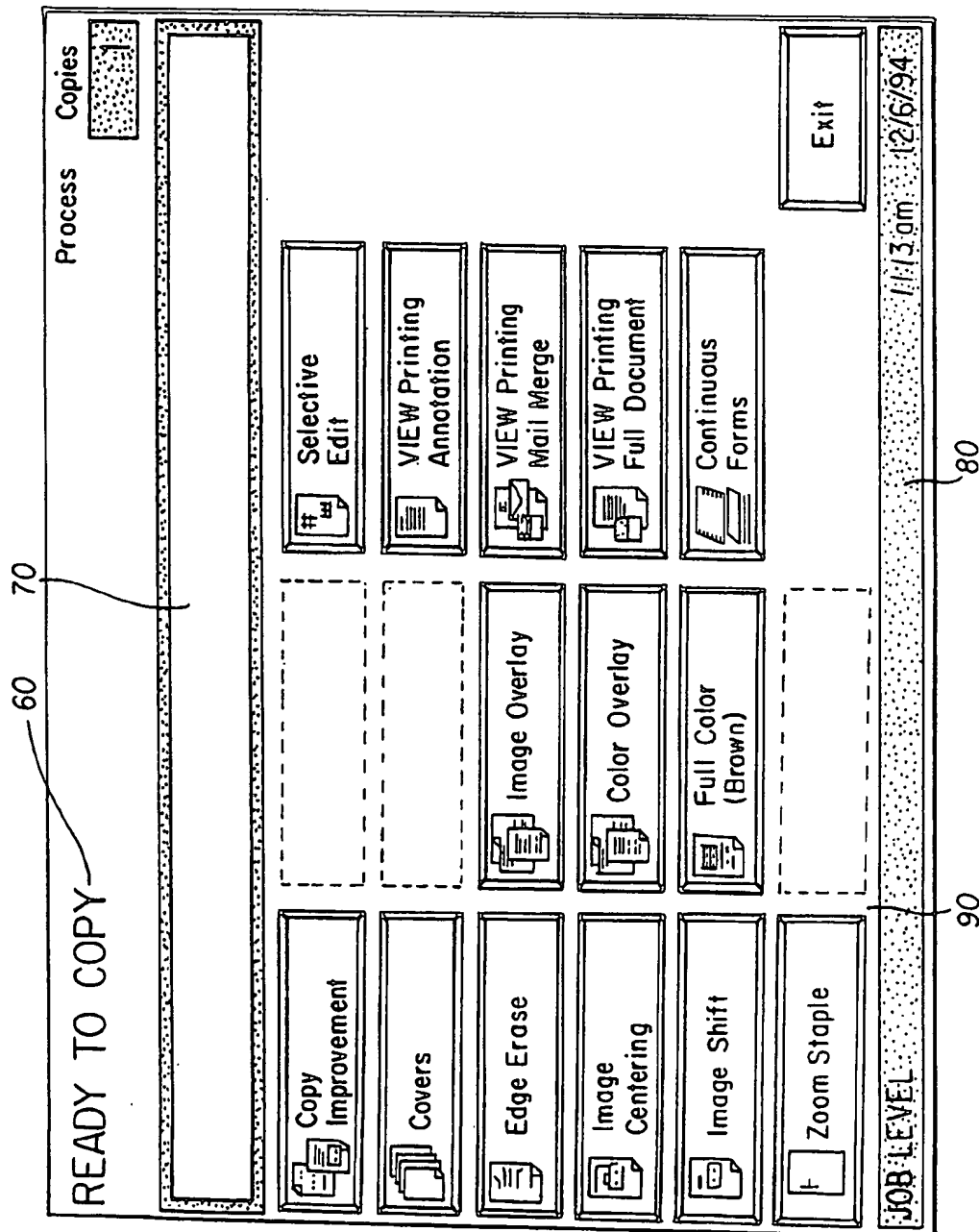
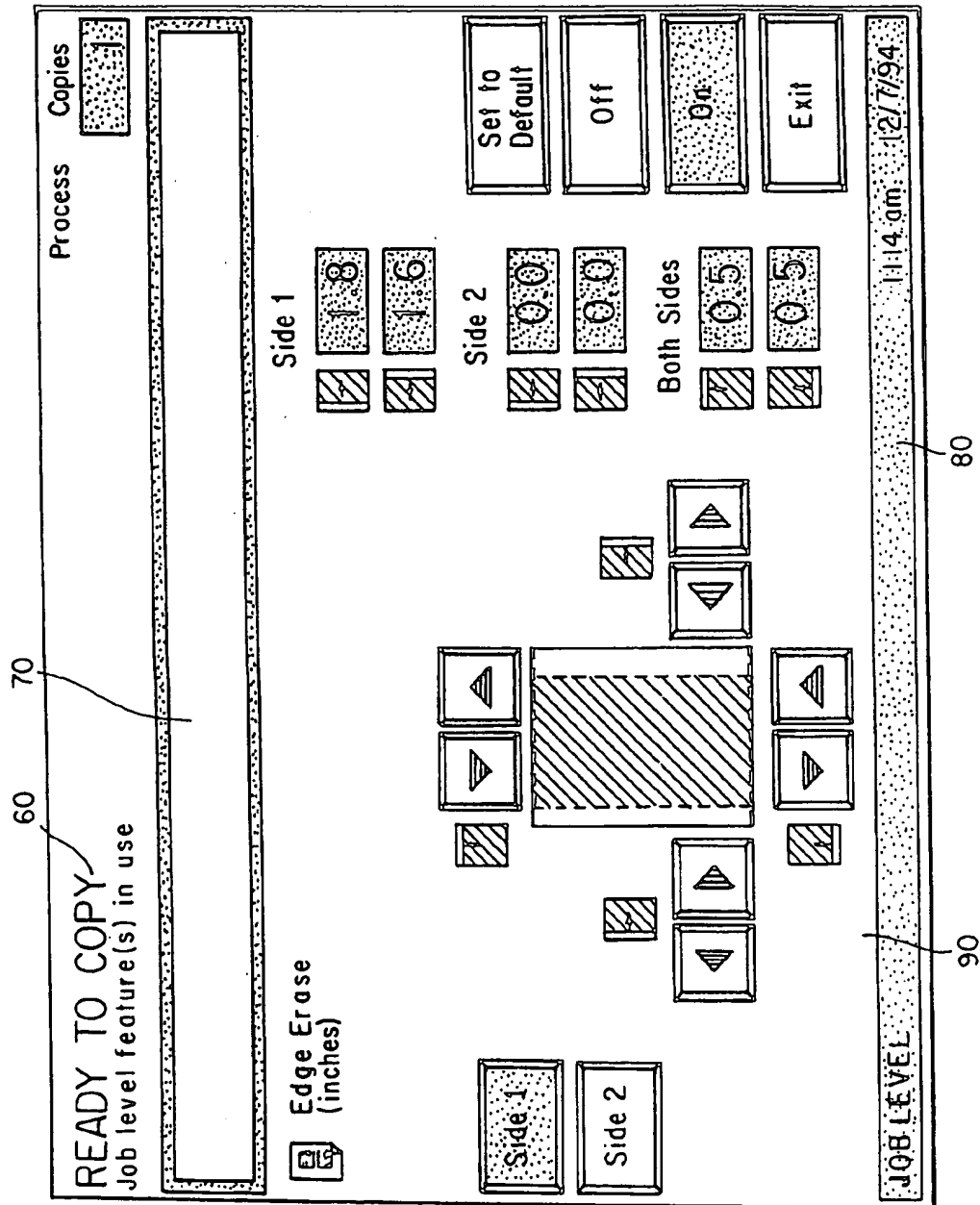


FIG. 7



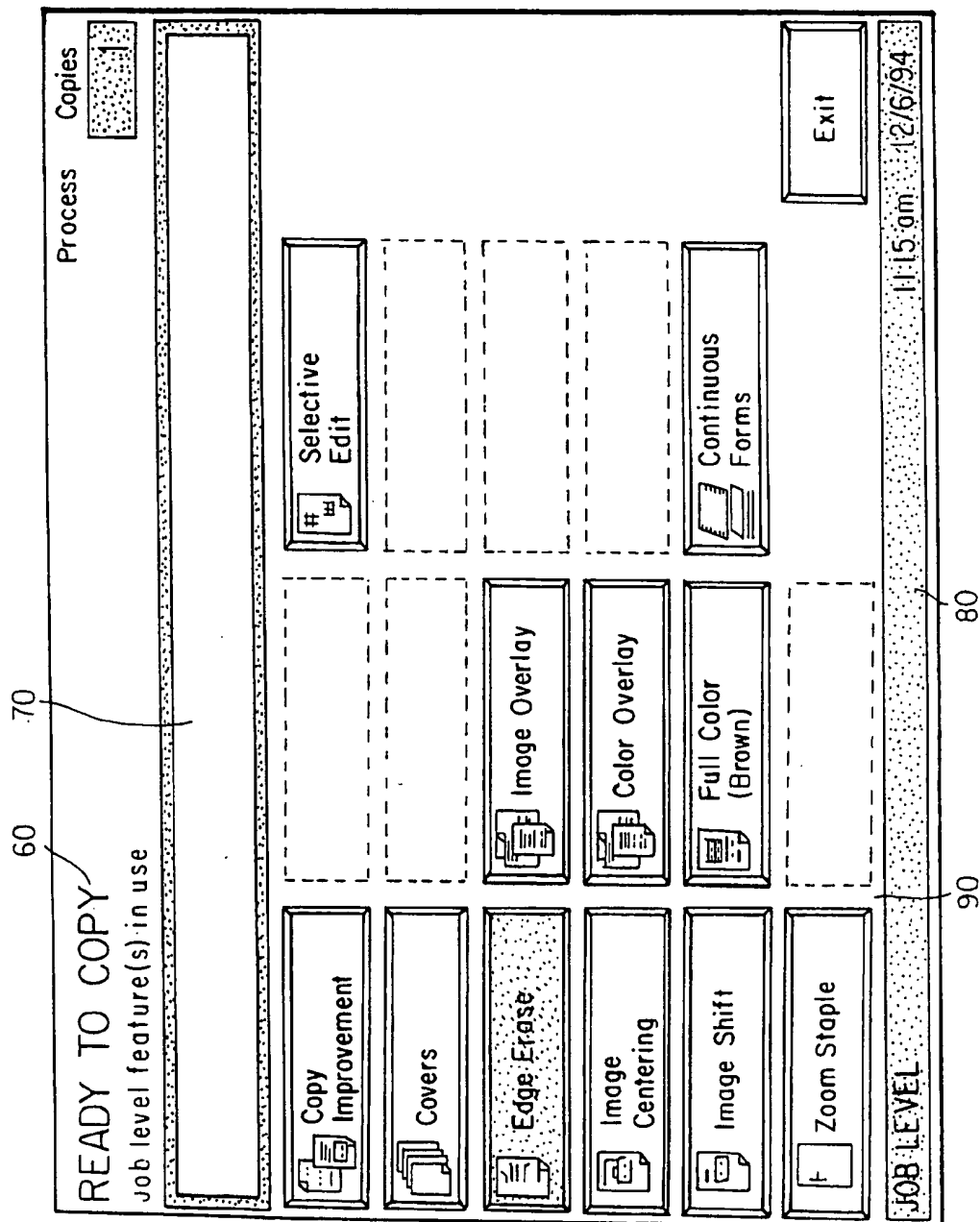


FIG. 9

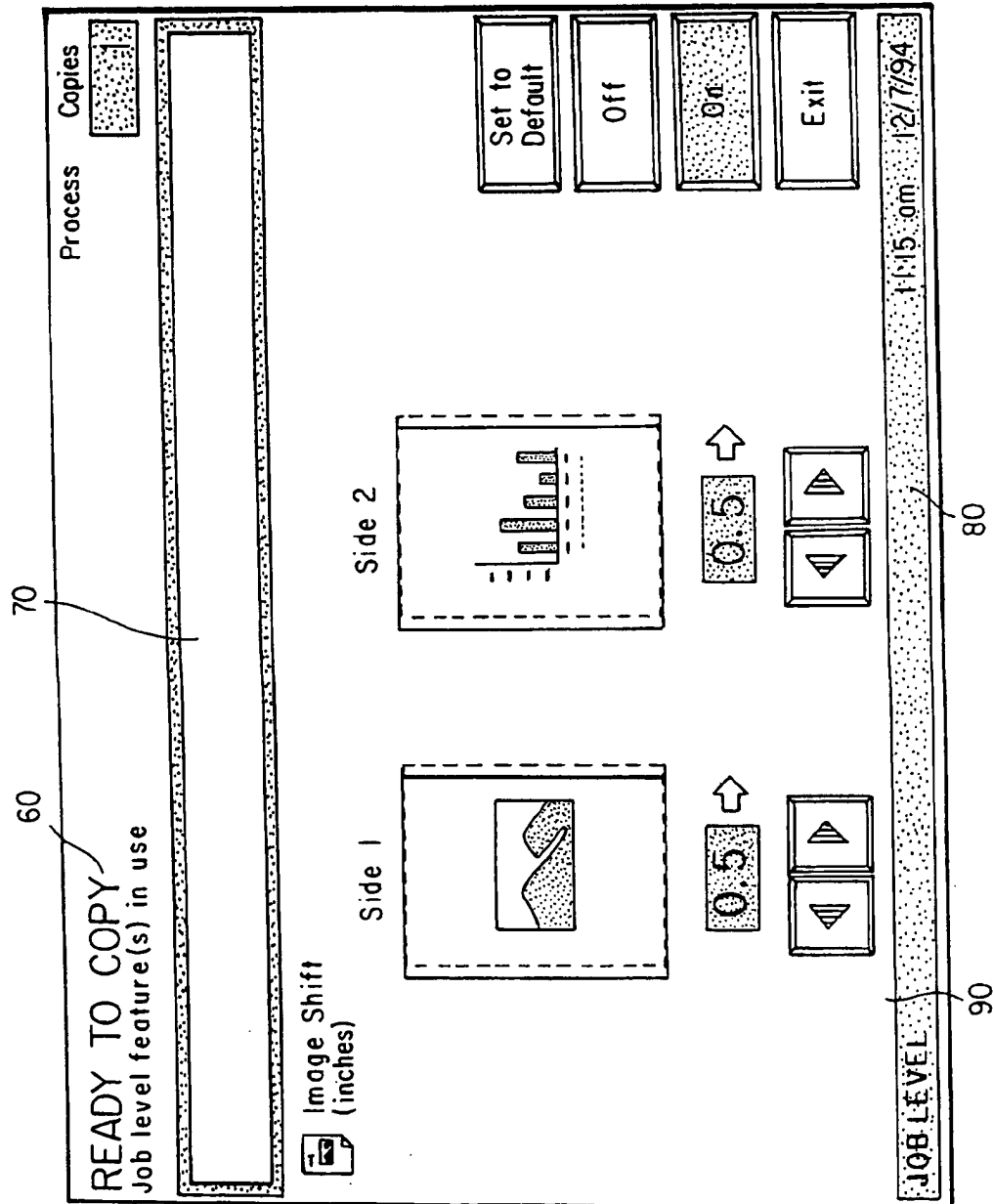
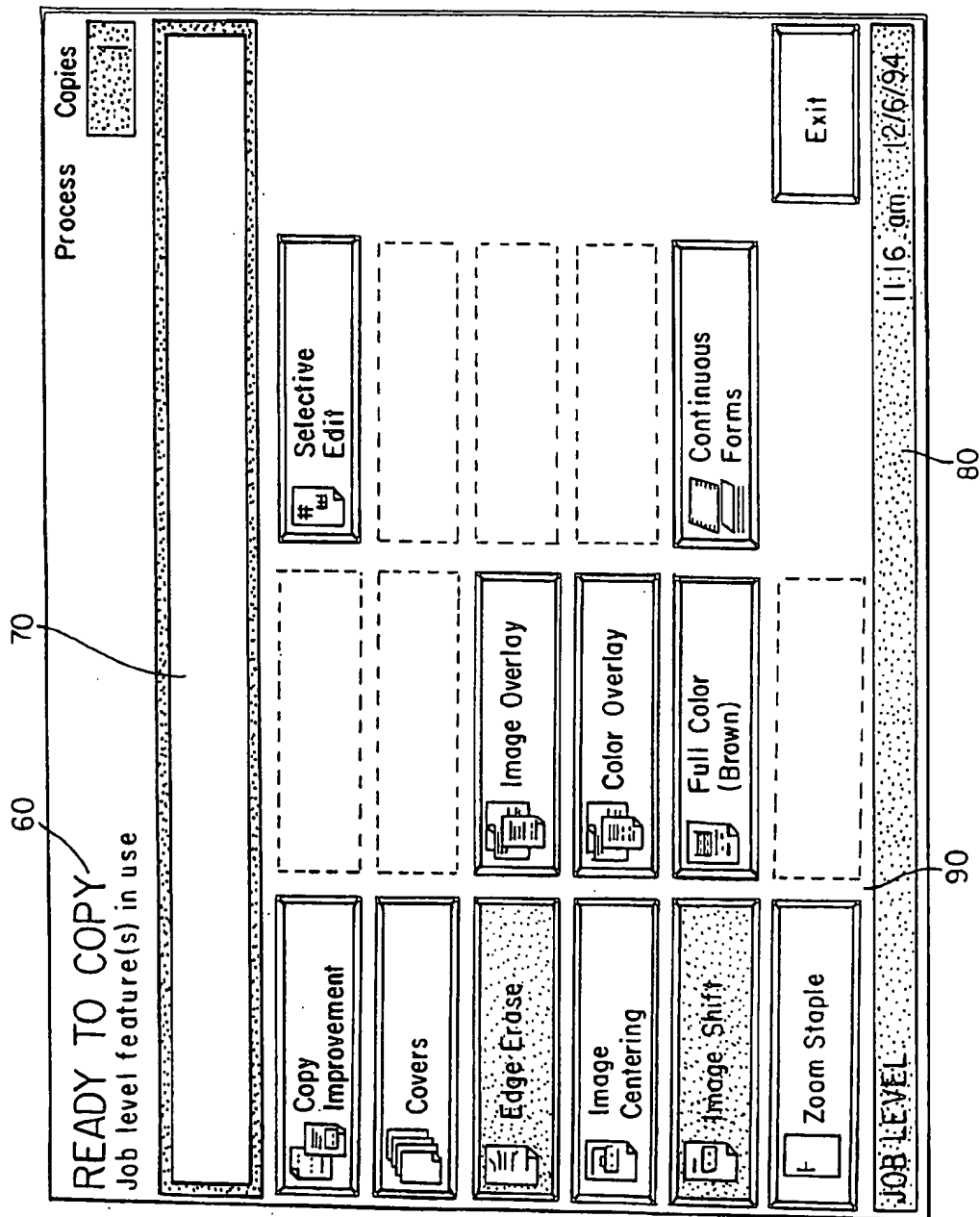


FIG. 10



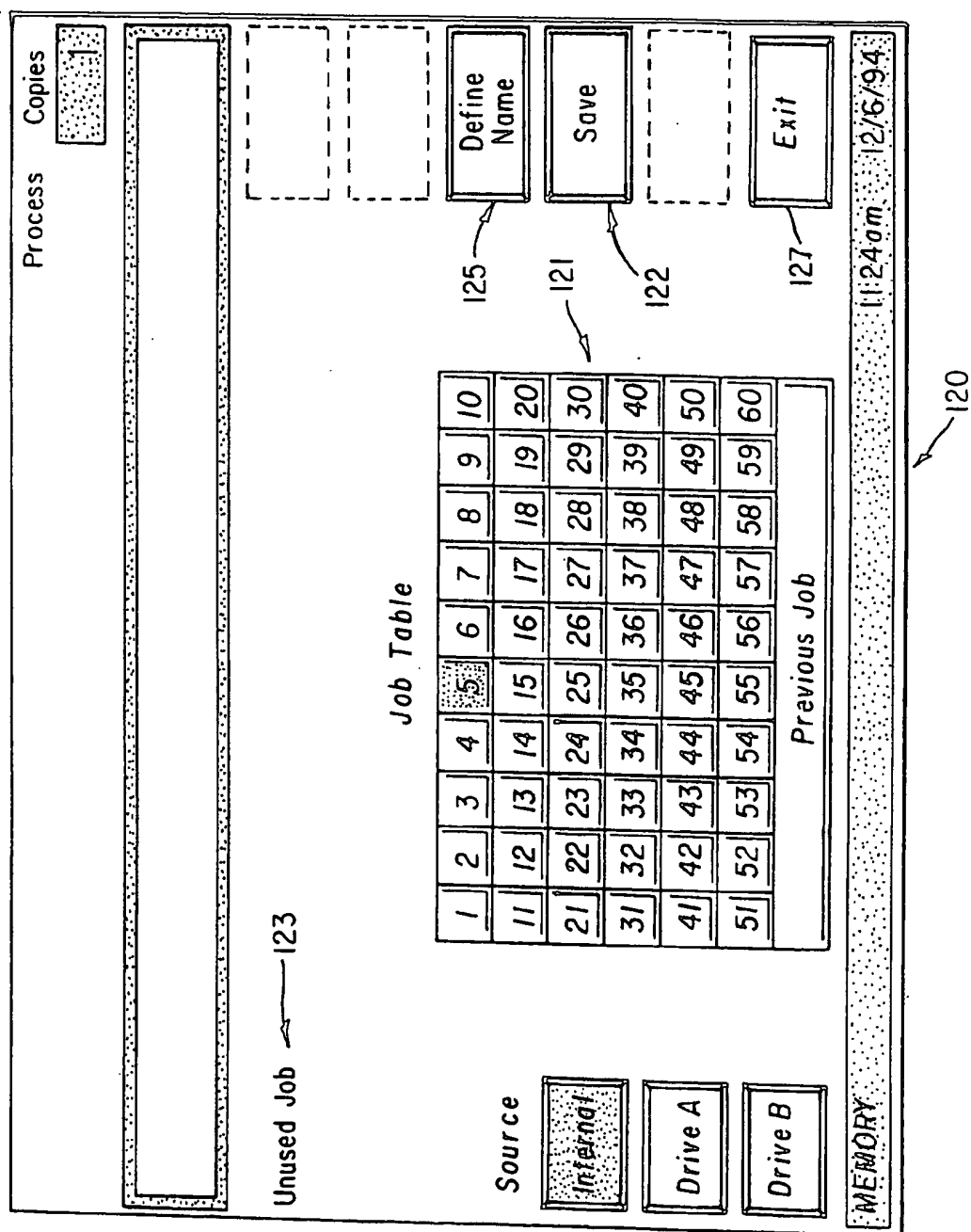


FIG. 12

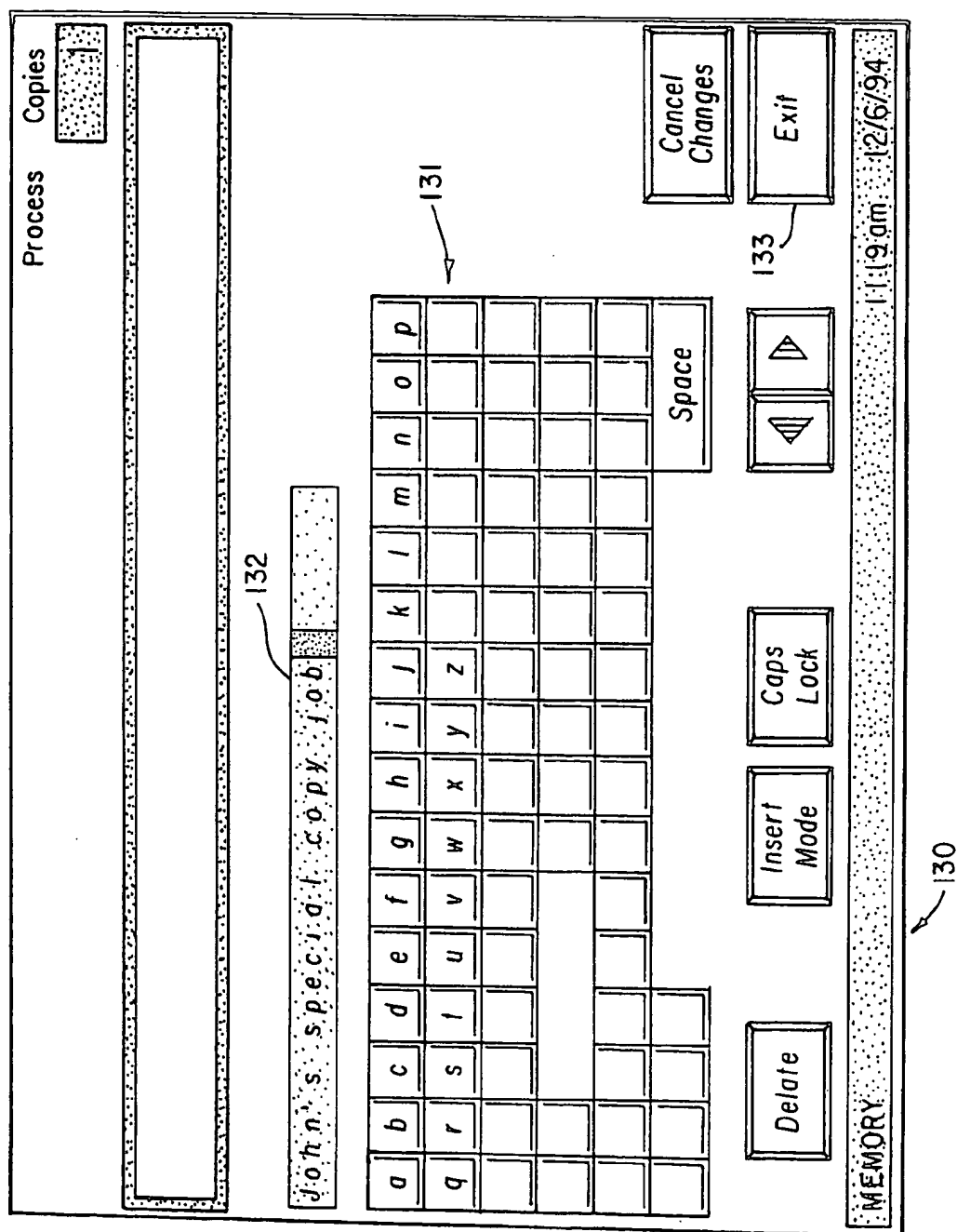


FIG. 13

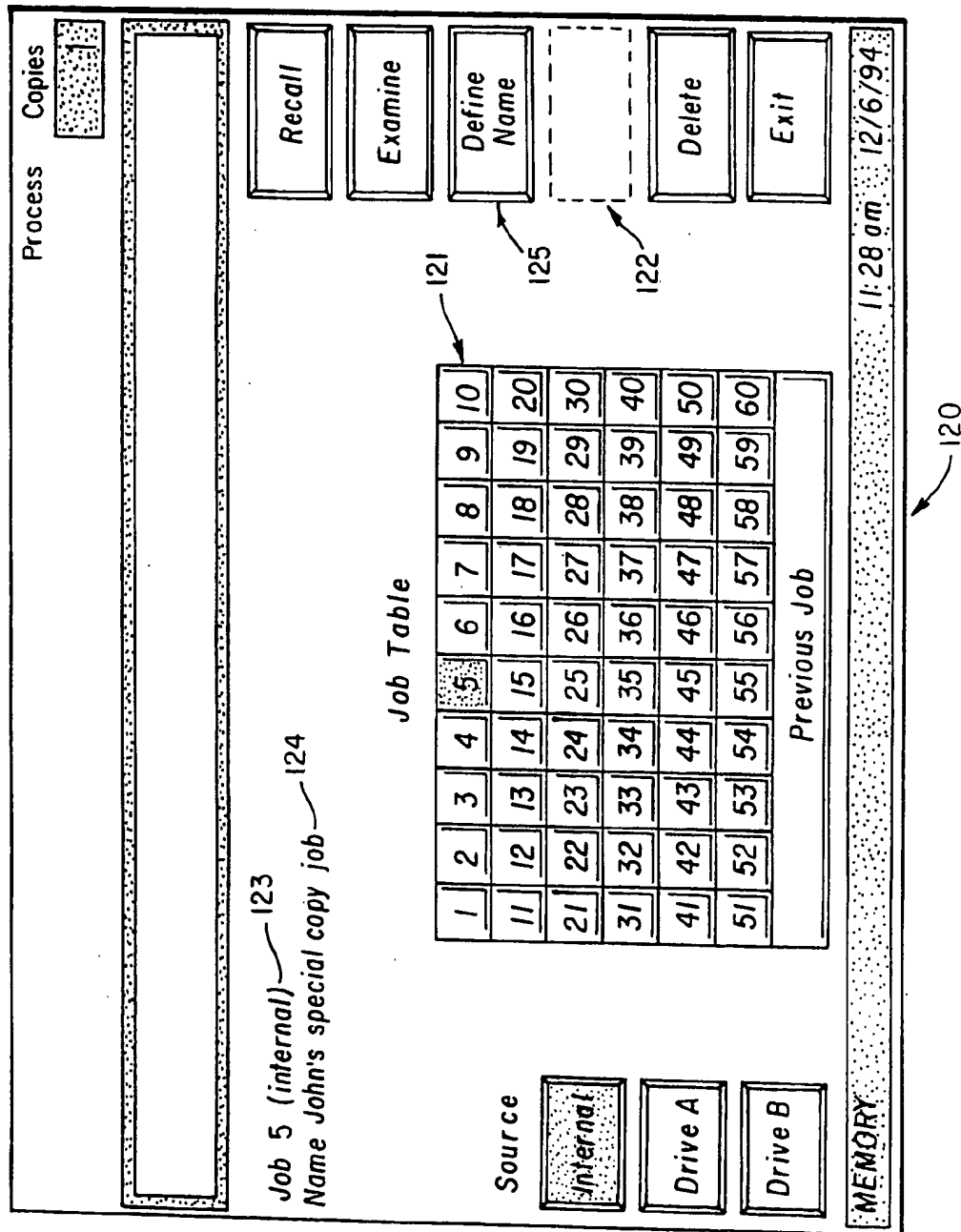


FIG. 14



FIG. 15

Process Copies

*Job 25 (internal) — 123*

**Job Table**

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60

*Previous Job*

Source Internal Drive A Drive B

Recall
Examine
Define Name

Delete
Exit

11:28 am 12/6/94

MEMORY

120

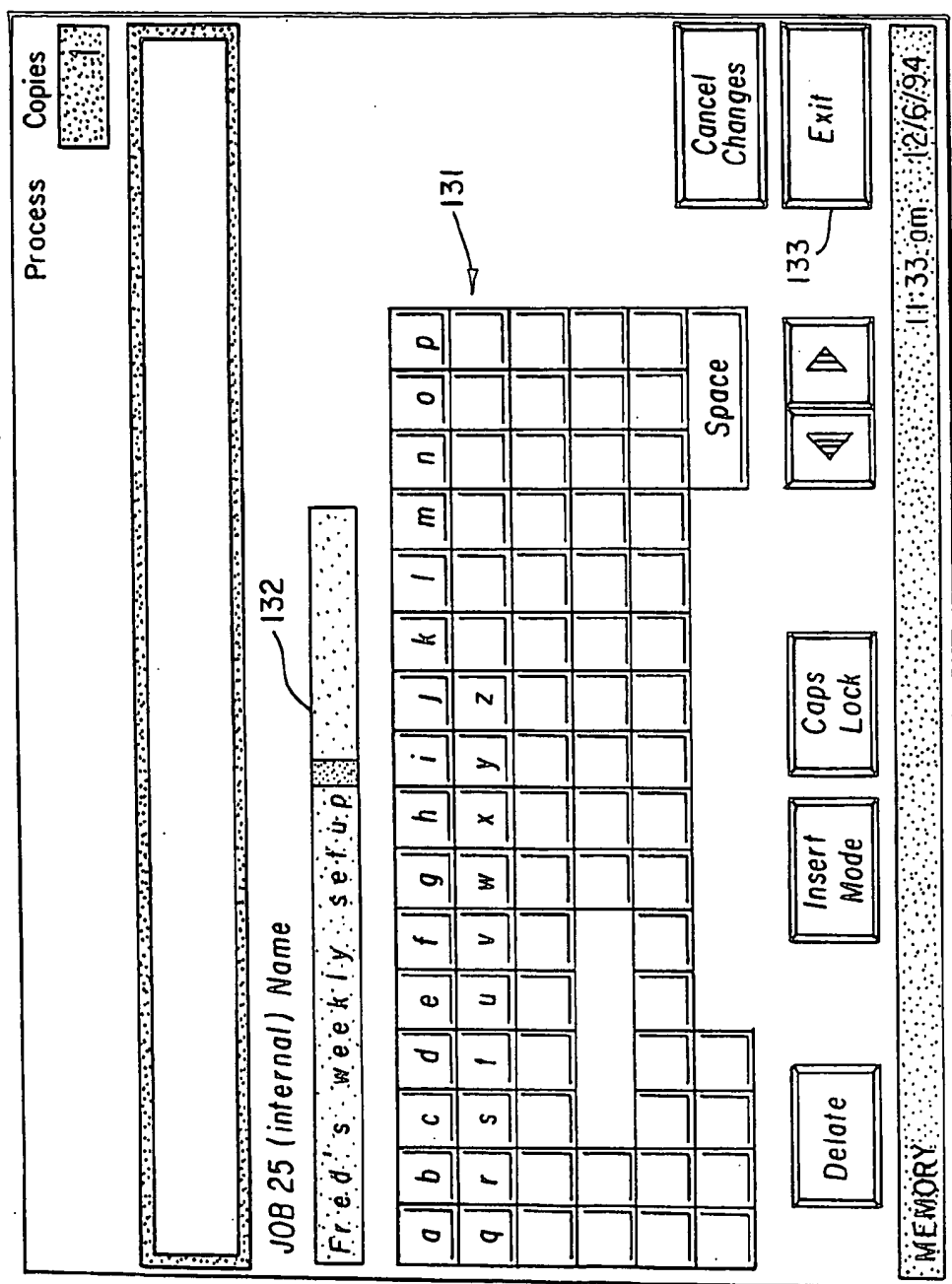


FIG. 16

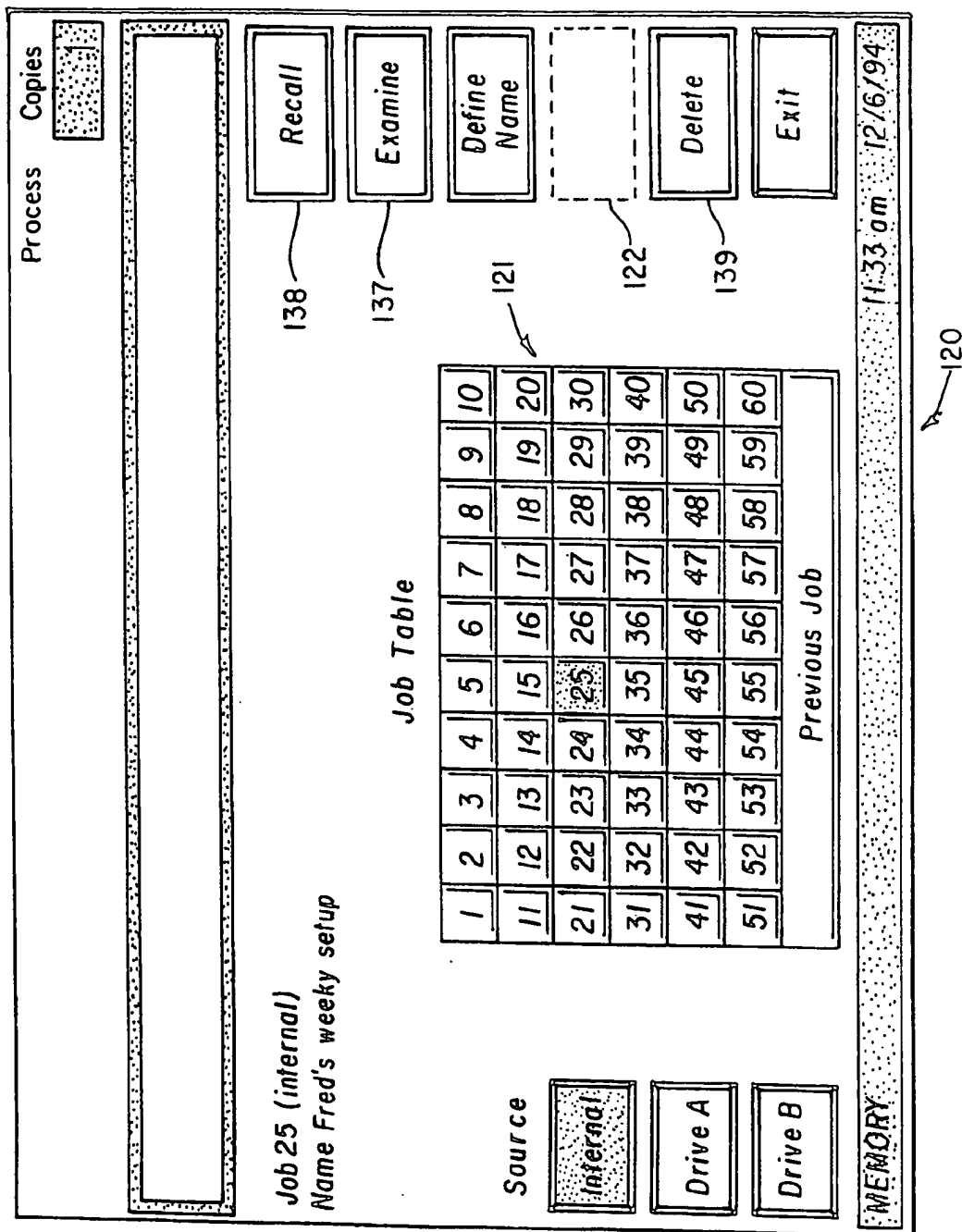


FIG. 17

# JOB STORAGE/RETRIEVAL SYSTEM AND METHOD FOR REPRODUCTION APPARATUS

## FIELD OF THE INVENTION

The present invention relates to operator control systems and methods for reproduction apparatus such as electrostatographic copiers or printers and more particularly to improvements in such systems and methods that facilitate the storage and retrieval of reproduction jobs.

## BACKGROUND OF THE INVENTION

High speed reproduction apparatus such as electrostatographic copiers and printers have become extremely versatile as to document input and copy output capabilities, as well as to the image adjustments and modifications that can be effected. For example, with automatic accessories such as document handlers, sorters, and staplers, such apparatus can operate in various input-output modes, for example simplex-to-simplex, simplex-to-duplex, duplex-to-simplex and duplex-to-duplex and can deliver very high volume outputs in various forms, e.g., stapled, stacked, in bins etc. The apparatus can be set to vary the document copy images, e.g., as to contrast, density, color, size (enlarge-reduce), location (image placement on the page), screening (for continuous tone originals) image reversal (positive-negative), x-and-y scaling, area or edge erasing etc.

Of course, all the above capabilities involve choices which an operator must make (or defer to a nominal setting). Moreover, the operational parameter setup for a given job can include not only the number of copy sets desired and choices about the above parameters, but selections about different portions of the job. For example, a job level selection can be made to effect every page of the job. A page level selection can be made to effect one or more designated pages within the overall job document. And, area level selections can be made to effect changes, e.g., erase or screening, on only certain portions of a particular page.

It can be appreciated from the foregoing that job setup for high speed reproduction apparatus is complex work that even skilled operators find challenging and time consuming. Since "jobs" often involve the production of many document sets, errors can be fairly costly. To ease this situation, various touch-selection screen display devices, showing mode and feature selection options in sequential displays, have been developed, along with prompting instructions displays that are tailored to casual and/or skilled operators (see e.g., U.S. Pat. No. 5,049,931). Such improvements assist operators significantly; however, the "setup" of a complicated job (e.g., with many special selections) still requires significant time and concentration of a skilled operator. For this reason it is desirable to be able to "save" the set-up work that has been accomplished.

U.S. Pat. No. 4,970,554 describes a system employing a machine readable job ticket that contains a job number and instructions for parameter selections for that job. The instructions are filed in memory, accessible by the job number code, and the job ticket is kept with the originals to be reproduced. When reproduction is to occur, the originals are delivered to the reproduction apparatus, and the operator accesses system memory via the job number code to gain the stored parameter selections. This system would be useful for minimizing set-up time for subsequent identical jobs, so long as the job ticket was not lost. However, even if the job ticket is available it is not readily identifiable to the system

operator as the unique one among many, that was requested for re-run(s). That is, the job number code will access the control system to set the proper parameters of the reproduction apparatus, but the job number very likely will not register in the operators memory as any particular job. For this reason operators create lists of job code numbers with cryptic short file names to jog their memory about the particular job that is connected with the job code. If the job is used infrequently the operator can easily lose recollection of what the short file names relate to, or the file name lists can be lost or outdated. The operator then is confronted with the unpleasant choices of examining all saved jobs to locate the one with the required set-up, or reprogramming the job from scratch.

## SUMMARY OF INVENTION

One significant purpose of the present invention is to provide for complex reproduction apparatus, improved job storage/retrieval systems and methods that will reduce the difficulties described above. For example, systems and methods of the present invention provide a field for writing and displaying an operator-recognizable job description that is storable and retrievable in conjunction with a job code number, which will access the set-up parameters for that job. According to systems and methods of the present invention, such job descriptions can be defined either at the time a job is initially set-up and saved or when a previously saved job is recognized and retrieved.

Thus, in one aspect the present invention constitutes an improvement in reproduction apparatus of the kind having a plurality of operating features for producing copy jobs and an operator control communication interface including: (1) display and memory means for providing a first screen for indicating operating features for job selections (2) signal generators for producing a signals set representing selected operating features and (3) control means for producing a copy job in accord with the selected operating features. The apparatus memory has a means for storing data representing the selected signals set with an associated job number retrieval code and in accord with improvements of the invention the apparatus comprises: (i) memory for providing a second screen display for indicating a plurality job description characters to be chosen by the operator, (ii) means responsive to operator character choices to record a job description, (iii) means for storing the job description in the apparatus memory in retrievable association with the signal set and job number retrieval code and (iv) means responsive to job number retrieval code address for retrieving the signal set and displaying the job description associated therewith.

In another aspect the present invention constitutes an improved method of job description, storage and retrieval for reproduction apparatus of the kind having a plurality of operating features and an operator control communication interface having a screen display for operator selection of such features. The method includes (a) displaying a features screen(s) having selectable operating features, (b) selecting the desired features for a predetermined job, (c) generating a signals set representing such selected features, (d) generating a job number for said predetermined job, (e) displaying a job naming screen having selectable job description characters, (f) selecting characters on said job naming screen to form a visually readable job description for said predetermined job, (g) and storing the signals set, job number and job description for said predetermined job in retrievable association. Thus, the job description will be retrieved and displayed in response to by the operator's accessing of the

job number so as to enhance operator recollection of the particular predetermined job, and the associated operating features signals set can be readily utilized to reproduce the predetermined copy job without reprogramming of the reproduction apparatus.

### BRIEF DESCRIPTION OF DRAWINGS

The subsequent description of preferred embodiments of the invention refers to the accompanying drawings wherein:

FIG. 1 is a perspective view of a typical reproduction apparatus including an operator control communication interface utilized in improved job storage/retrieval according to the present invention;

FIG. 2 is a schematic illustration of the paper paths and operating electrophotographic subsystems of the FIG. 1 apparatus;

FIG. 3 is a block diagram of the control of the FIG. 1 apparatus;

FIG. 4 is an enlarged schematic view of the hard keyboard control panel shown in FIG. 1;

FIG. 5 is a front view of the active display device of the FIG. 1 apparatus showing an operating feature selection screen with a standard features, nominal settings format in accord with one preferred embodiment;

FIG. 6 is a view of the standard operating feature selection screen shown in FIG. 5, with alternative operating feature selections registered;

FIG. 7 is a view of another operating features selection screen addressed on the FIG. 1 apparatus display device;

FIG. 8 is a view of yet another operating features selection screen addressed on the FIG. 1 apparatus display device;

FIGS. 9-11 are views of still further operating features selection screens addressed onto the display device of the FIG. 1 apparatus;

FIG. 12 is a view of a job memory screen, according to the invention, addressed onto the display device of the FIG. 1 apparatus;

FIG. 13 is a view of a job naming screen according to the invention addressed onto the display device of the present invention; and

FIGS. 14-17 are further views similar to FIGS. 12 and 13 but showing other stages of job name definition and job storage and retrieval according to the present invention.

### DETAILED DESCRIPTION OF THE INVENTION

Referring now to the accompanying drawings, FIG. 1 shows a typical reproduction apparatus, designated generally by the numeral 10, including an operator control communication interface 20 utilized in simplifying job storage and retrieval according to this invention. The exemplary reproduction apparatus 10 has a marking engine 12 for producing copies of original information, such as original documents circulated by a document feeder 14. Several well known finishing accessories, such as sorters 16 and stacker/stapler 18, are associated with marking engine 12. Of course, other well known marking engines and associated accessories, serving in various configurations as copiers or printers, can be used advantageously with this invention.

The basic arrangement and operation of the exemplary marking engine 12 for the reproduction apparatus 10 is shown in reference to FIG. 2 and includes a dielectric support 22, in the form of an endless web, supported for

movement about an endless path. In the reproduction cycle, the moving dielectric support 22 is uniformly charged as it moves past a primary charging station 24. Thereafter, the uniformly charged dielectric support passes through an exposure station 26 where the uniform charge is altered to form a latent image charge pattern corresponding to information desired to be reproduced. Depending upon the characteristics of the dielectric support and the overall reproduction system, formation of the latent image charge pattern may be accomplished by exposing the dielectric support 22 to a reflected light image of an original document to be reproduced delivered to a transparent platen 30 by the document feeder 14. Alternatively, formation of the latent image charge pattern may be accomplished by "writing" on the dielectric support with a series of lamps 26' (e.g., LED's or lasers) or point electrodes actuated by electronically generated signals based on the desired information to be reproduced.

The latent image charge pattern on the dielectric support 22 is then brought into association with a development station 28 which applies pigmented marking particles to adhere to the dielectric support to develop the latent image. The portion of the dielectric support 22 carrying the developed image then passes through a transfer station 32 in register with a receiver member fed in proper timed relation from a supply hopper 34 along the path P. An electric field produced in the transfer station 32 attracts the marking particles of the developed image from dielectric support to the receiver member.

The electric transfer field may also cause the receiver member to adhere to the dielectric support 22. Accordingly, a destack mechanism (not shown), immediately downstream in the direction of travel of the dielectric support, is provided to facilitate removal of the receiver member from the dielectric support. The destack mechanism may be, for example, an AC corona charger for neutralizing the attractive field holding the receiver member to the dielectric support. After the developed image is transferred to the receiver member and the receiver member is separated from dielectric support, the receiver member is transported through a fusing device 36 where the image is fixed to the receiver member by heat and/or pressure, for example.

The receiver member bearing the fixed image is then selectively delivered to an appropriate desired output. The output may be directed along the path P<sub>1</sub> to a top exit hopper 38 for direct operator retrieval, or along path P<sub>2</sub> through a side exit for delivery to one of the output accessories 16, 18. Alternatively, the output may be directed along the path P<sub>3</sub> to an intermediate hopper 40, where it is effectively turned over and delivered along the path P<sub>4</sub> to return to the transfer station 32 to enable a duplex reproduction to be formed on such receiver member. Simultaneously, with delivery to the desired output, the dielectric support 22 is cleaned of any residual marking particles at cleaning station 42 and returned to the primary charging station 24 for reuse.

The reproduction apparatus 10 has many different user selectable operating features. For example, duplex document booklets may be formed from simplex or duplex original information, or information to be copied may be edited to change its size, content, or orientation. Further examples of selectable operating features where noted in the background section and other exemplary selected operating features are noted in more detail below. It will be appreciated, that with all these communications required between the user and the apparatus and the apparatus and a highly sophisticated communication interface is required.

The operator control communication interface 20 includes, for example, a display device 11 having a touch

activated screen with a manually activated keyboard panel 50. The operator control interface 20 is electrically coupled to a logic and control unit L located, for example, within the housing of the reproduction apparatus 10. One logic and control unit L illustrated schematically in FIG. 3, includes a microprocessor based controller electrically coupled to the marking engine and accessories of the reproduction apparatus 10. The controller includes random access memory (RAM), read only memory (ROM), and other non-volatile memory. The controller may also include a reader/writer to non-volatile media, such as a disk. Of course, the operator control interface 20 may alternatively include a stand-alone logic and control unit which would then, in turn, be electrically coupled to the logic and control unit L of the reproduction apparatus 10.

In order to control the reproduction apparatus 10, the controller of the logic and control unit L receives input signals from the operator control communication interface 20 and a plurality of sensors associated in any well known manner with the reproduction apparatus marking engine 12 and accessories 14, 16, and 18. Based on such signals and a program for the microprocessor, the logic and control unit produces appropriate signals to control the various operating devices within the reproduction apparatus. The production of a program for a number of commercially available microprocessors is a conventional skill well understood in the art and does not form a part of this invention. The particular details of any such program would, of course, depend upon the architecture of the designated microprocessor.

The present invention provides improved structures and modes for the FIG. 1 reproduction apparatus to store and retrieve the data signals representing a complex reproduction job(s), which in this context will comprise a large number of operating feature selections from the vast menu available with the apparatus 10. One preferred combination of hardware and software for use in accord with the invention comprises the hard key panel 50 and touch screen display device 20, shown e.g., in FIGS. 4 and 5, as operable under the control of logic and control system L, with its associated memories and microprocessor. Thus, the hard keyboard panel 50 can comprise, among other mode selection keys, a job level selection mode key 51, a page level selection mode key 52, a memory selection mode key 53, and a reset key 54. Other mode selection keys such as start 55, stop 56, interrupt 57, etc., are provided, but not involved directly with the description of the invention.

FIG. 5 shows a standard features screen that is addressed (with nominal selections) onto display device 11 from memory of the logic unit L, in response to the operator pushing the reset key 54 of panel 50 to initiate a new job set-up. In general, the selection screen includes a top banner section 60, a message section 70, a lower banner section 80 and a main display field 90. Section 60 conveys information relative to the general reproduction apparatus status and section 80 conveys the generic name for the information within the main display field 90. Section 70 is available for other operator information or directions. The screens will highlight selected features; and FIG. 5 shows simplex to simplex copy mode, collated, using the lower paper supply (with 8½ inch paper), an average copy density (5), 100% magnification, copies delivered to the top exit hopper, without staples, which are typical nominal selections presented to the operator at the commencement of job set-up selections. The operator's task is to accept or change these nominal selections as well as to make other selections from subsequent screens called to address upon display device 11.

For example, FIG. 6 shows the standard features screen as it would exist when the operator had exercised selection (by touch of designated screen regions) of "simplex original to duplex output", copy output to the "finisher straight" and portrait staple instead of the nominal selections shown in FIG. 5.

FIG. 7 illustrates an additional operating features selection screen (job level) addressed onto device 11 by the operator actuating the job level key 51 of the keyboard 50. In this context, the term job level refers to operating features that the operator can select to pertain to each page of output copy. To further illustrate, FIG. 8 shows the edge erase work screen addressed onto display device 20 in response to the operator touching the edge erase selection region of job level screen shown in FIG. 7. After the operator enters the desired erase instructions, via the FIG. 8 erase screen, the exit or job level regions of that screen are touched to return to the job level features selection screen, which now shows "edge erase" highlighted (selected), see FIG. 9.

As a further illustration, FIG. 10 shows an image shift work screen addressed onto display device 20 in response to the operator next touching the image shift region on the job level selection screen of FIG. 9. The operator again enters the desired instructions (adjustment of image position), and thereafter touches the exit or job level regions of the image shift screen (FIG. 10) to return to the job level selection screen, (which, as illustrated in FIG. 11), now shows the image shift region highlighted. It will be appreciated that many more operating feature selections are available to the operator, e.g., copy improvement, covers . . . continuous forms, by addressing further instruction subscreens to the display device 20, by touch of regions on the job level selection menu screen (e.g., FIG. 11).

After the operator has completed the detail selection process for setting up a job with predetermined operating features, the copy job can be effected by actuating the start key 55 on panel 50. More particularly, as operating features are selected by the operator (or allowed to exist in the case of nominal standard features), the display device 11 generates corresponding selection signals, that are detected and stored by logic and control L. When the selections are complete and copy start actuated, the logic and control operates the apparatus 10 in accord with fixed parameters, e.g., from ROM memory and in accord with job selected parameters stored in other logic memory, e.g., RAM memory. However, it often occurs that the operator's job may involve a possible re-ran, e.g., if more copy sets might be subsequently requested. In this situation, the experienced operator would wish to "save the job", e.g., record the data corresponding to the signals set representing the job operating feature selections in a non-volatile memory location, together with a job number data code for retrieving the signals set. The operator may wish to make a "save the job" decision before or after the copy ran, but would need to do so before the job data was replaced or erased in memory of logic unit L.

FIG. 12 shows a job store/retrieve memory screen 120 addressed onto the display device 20 by the operator actuating memory key 53 on hard panel 50, which will allow the operator to save the job in accord with the invention. Thus, FIG. 12 reflects that the operator has selected, in job table touch keyboard 121, to store the operating feature signals for the above discussed job, as job number "5" (identified as an unused job in the memory status region 123 of screen 120) If the "save" region 122 of the FIG. 12 screen is touched, the data representing the job selections signals set will be recorded from temporary memory (e.g., RAM) to a perma-

nent memory portion of logic unit L (e.g., non-volatile memory or media), together with identifying retrieval code data corresponding to the job number ("5"). A job run could then be commenced by returning to the standard features screen, via the exit button 127, and actuating the start key 55.

However, in accord with a particularly preferred aspect of the present invention, the foregoing job can also be stored with a job description that the operator will recognize more easily in the future than the bare designation "job 5".

Thus, by touching the "define name" region 125 on the store/retrieve memory screen shown in FIG. 12, the job naming screen shown in FIG. 13 can be addressed from memory, e.g., ROM of logic unit L, onto display device 20. As shown, the job naming screen comprises a keyboard 131, having e.g., the typical alpha-numeric characters for word/phrase typing, as well as punctuation characters. By sequentially touching individual character regions on the keyboard of the naming screen sequentially, a word/phrase job description (or other such recognizable character string) can be recorded, and is displayed in a job description region 132 on screen 130. After completion of the recording of a satisfactory word/phrase description for the job, e.g., "John's special copy job", the operator touches the exit region 133 of the naming screen 130. The job store/retrieve memory screen 120 reappears as illustrated in FIG. 14, now showing (in status region 123) that the memory region addressed is allocated to job number 5 and also showing, in name region 124, the job description name just recorded on screen 130. The operator now touches the "save" region 122 and the features selections signals set data, the job number code data, and the word/phrase job description data are all stored in mutually retrievable association in non-volatile memory of logic L. Therefore, at a subsequent time the operator can recognize and retrieve this job in a convenient, reliable manner by actuating memory key 53 to address a screen such as shown in FIG. 12 to display device 20. The job key regions of the job table can then be actuated to scan the stored jobs and when the job table number 5 region is addressed the job description shown at 124 in FIG. 14 will appear to inform or confirm to the operator that this is the desired job set-up for rerun.

The above described naming procedure, according to the invention, can also be employed advantageously to name a job previously saved in memory with the bare job number e.g., "25". Thus, FIG. 15 shows the screen 120 addressed onto display device 20 (by actuation of memory hard key 53), with the key region "25" having been actuated and indicating in memory status region 123, that job 25 is stored there. Advantageously, the operator can then touch the "Examine" region 137 to review summarizations of the standard level, job level and page level features that have been selected for job "25", by the system described in concurrently filed U.S. application Ser. No. 08/398,231, entitled "IMPROVED SYSTEM AND METHOD FOR JOB SET UP SUMMARIZING IN REPROGRAPHIC APPARATUS", by Smith, Altreith and Beaudet, which is incorporated herein by this reference. After confirming job 25, the operator can touch "define name" region 125 of screen 120 to cause the address of job naming screen 130 onto display device 20. The touch region keyboard 131 can now be operated to record a word/phrase name description for job 25, which is displayed in region 132, below the job number, see FIG. 16. The job description "Fred's weekly set-up" is thereafter saved with the job number and the data signals representing the selected operating features of the set-up, by actuating the exit region 133 of screen 130, to return to store/retrieve memory screen 120 shown as now updated in

FIG. 17. Actuation of save region 122 on screen 120 completes the naming update as previously described.

The operator can also retrieve a saved job, revise and rename it, e.g., "Fred's weekly set-up, revised 1/6/95". To accomplish this, the operator addresses the memory screen of FIG. 17 to device 11, by actuating the hard key 53. The button region "25" of touch keyboard 121 on that screen is then actuated to address the desired saved job in memory. Next, the "Recall" touch region 138 is actuated to retrieve the entire signals set for saved job "35" from the hard memory of Unit L and transfer it to RAM memory as a current job (with a standard features screen, such as FIG. 5, being displayed with the saved job features indicated thereon). The operator then manipulates the screens and selections, in the manner first described above regarding a new job set up, to effect desired revisions. Upon completion of revisions the memory hard key 53 is actuated to return to a memory screen, such as FIG. 14. The define name operation is actuated as with a new job and the revised word/phrase job description is typed on the keyboard 131 shown in FIG. 16. After return to the memory screen the old job "25" can be replaced in memory by actuating job key 25 and actuating the "Delete" touch region 139 (see FIG. 17). The new (revised) job is then allocated to job number "25" together with its revised job description, "Fred's weekly set up revised, 1/6/95", by actuating the "Save" region 122, which in this instance will be highlighted and available because the old job has been deleted from hard memory.

While the example job descriptions herein comprise mainly word/phrase character strings it will be appreciated by those skilled in the art that other character strings may be devised and recorded in patterns recognizable to an operator as a job description for a particular job, e.g., using abbreviations or acronyms. Thus, the terms "words" and "phrases" as used herein are intended to include such other operator-recognizable character strings.

The invention has been described in detail with particular reference to preferred embodiments, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as set forth in the claims.

I claim:

1. In reproduction apparatus of the kind having a plurality of operating features for producing copy jobs and an operator control communication interface including: (1) display means for indicating selectable operating features on a selection screen, (2) signal means for generating a set of signals in accord with selections on the selection screen of said display means, (3) control means responsive to said signals set for actuating said apparatus to produce a copy job in accord with said selections and (4) memory means for storing copy data including the signal sets indicative of the selected job operating features and a job number retrieval code, the improvement wherein said control communication interface further comprises:

- (i) means for addressing said display means with a job naming screen indicating a plurality of selectable job description characters;
- (ii) means responsive to operator selections of said job description characters for recording a multicharacter job description;
- (iii) means for storing said recorded job description in said memory means, in association with the related job number retrieval code and corresponding operating features signals set; and
- (iv) means, responsive to address by said job number retrieval code, for displaying said recorded job description.

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2. The invention defined in claim 1 wherein said job description characters include alphanumeric characters and punctuation characters such that said job description can comprise words and phrases.

3. The invention defined in claim 1 wherein said control communication interface comprises means for addressing said display means to display a store/retrieve memory screen indicating a plurality of operator selectable job code numbers and a region showing selected job codes in association with their recorded job descriptions.

4. The invention defined in claim 3 wherein said display means comprises a touch-activated video screen having means for displaying different video fields respectively showing operating feature selections, job description character selections and job code number selection.

5. The invention defined in claim 4 wherein said operator control communication interface further comprises a hard keyboard, wherein said video screens for operating feature selections and for job code number selections are activated for display via said keyboard and wherein said video screen for job description character selection is activated for display by touch address of a region on said store/retrieve memory screen.

6. The invention defined in claim 5 wherein said mean for storing said recorded job description character data in association with corresponding job number code data and operating features selections signals set is activated by touch address of a region of said store/retrieve memory screen.

7. The invention defined in claim 6 wherein said store/retrieve memory screen includes a plurality of touch address job key regions designating job numbers and said means for displaying job descriptions with related job number is activated by touch address of said job key regions.

8. The invention defined in claim 1 wherein said display means comprises a touch activated screen addressable to provide different video fields presenting job operating features and job description character selections.

9. In reproduction apparatus including a plurality of operating reproduction features and an operator control communication interface having a display screen for operator selections, an improved method of job description and storage comprising the steps:

- (i) displaying a screen having selectable operating reproduction features;
- (ii) selecting on said screen a plurality of operating features for a predetermined job;
- (iii) generating a job signals set representing said selected job operating features;

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- (iv) generating a job number for said predetermined job;
- (v) displaying a job naming screen having selectable job description characters;

- (vi) selecting on said naming screen a plurality of characters to form a visually readable description for said predetermined job;

- (vii) storing said job signals set in memory in retrievable association with said job number and said readable job description.

10. The method defined in claim 9 wherein the step of generating a job number includes displaying a job store/retrieve memory screen having a plurality of selectable job number regions and touch addressing a selected job number region.

11. The method defined in claim 10 wherein the display of job description characters is activated by touch addressing a name define region on said store/retrieve memory screen.

12. The method defined in claim 11 wherein a stored job description is displayed on the store/retrieve memory screen with its associated job number, when retrieved by touch address of a job key region on that memory screen.

13. In reproduction apparatus including a plurality of operating features and an operator control communication interface including an interactive display, a logic control and a memory for storing a plurality of stored job set up signals sets, an improved method for job retrieval comprising the steps of:

- (i) addressing a store/retrieve memory screen containing a plurality of activatable job identification number regions onto the display;
- (ii) selecting a job number region to retrieve a job set up signals set from memory;
- (iii) addressing a job naming screen having a plurality of selectable job description characters onto the display;
- (iv) selecting a plurality of such description characters to form an operator recognizable job description; and
- (v) storing the job signals set in memory in retrievable association with the job description formed by selected description characters.

14. The method of claim 13 further including the step of viewing summarizations of selected job operating features on the display after retrieving the job set up signals from memory.

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